

ing slide at rest as before described.) Thus the cardio-carotid time-difference may be found to measure one twelfth of a second, the cardio-radial one sixth of a second; or, whatever the interval at the moment of observation between the pulsation of the heart and that of any artery, this differential distance mathematically expresses it.

In further illustration of this subject, and to show variations of form and chronometry of the cardiac and arterial movements in health, tracings from three other individuals are produced. They are in *fac-simile* and with the original of enlarged representation just considered were all taken with the compound sphygmograph figured and described in a previous number of this journal.¹

Nos. II. and III. are respectively from young men each twenty years of age. No. IV. is from a man aged fifty-four years; the first part at rest, the last part immediately after active exercise.

The reader who is interested may study at his leisure the indications of these traces, assured that they truly represent the phenomena of cardiac and arterial movements passing in the individuals at the time the observations were made; for the skillful use of our method subordinates the sources of fallacy and gives results whose fidelity withstands the most rigorous tests.

Thus by this method a group of interesting and important facts come easily within our reach — facts physiological and clinical which a few years ago were entirely hidden from view for the want of the proper devices to disclose them; but now that the multiple simultaneous graphic method has been developed and made practical results are already manifest and richest revelations await to reward its freer application.

TWO HUNDRED CASES OF CHOREA.

BY H. C. HAYEN, M. D.

HOPING to find some facts bearing on the pathology of chorea, and particularly on the embolic theory, some time since I examined the records of two hundred cases treated at the Massachusetts General and City Hospital and the Boston Dispensary. Owing to the necessarily incomplete history and record of most who attend an out-patient clinic, little either for or against the embolic theory was elicited. Some other facts, which appeared from the tabulation of these cases, though now in the main universally acknowledged, may be of some slight interest.

SEX.

Females have always been known to be especially susceptible, the ratio between the sexes varying as one male to two, three, or four females. In this series seventy-two were males, one hundred and twenty-eight females, or not quite one to two. Gerhard in eighty cases found the preponderance of females greatest in the second decade, and attributed it to the relatively greater disturbance of the nervous system incident to the establishment and disorders of menstruation. Hasse, however, found in twenty-seven adults, aged from twenty to seventy-six years, quite as large an excess of females, the ratio being 1 to 2.5. Of eighty-eight of this series occurring in the second decade twenty-seven

were males, sixty-one females, or 1 to 2.25, only a slightly larger proportion than in the whole number.

AGE.

Of one hundred and ninety-five in whom the age was noted two were *said* to be congenital, eleven were less than six years old, ninety-two between six and eleven, fifty-eight between eleven and fifteen, twenty-two between fifteen and twenty-one, ten between twenty-one and sixty. These figures agree very closely with other statistics.

SEASON.

Weir-Mitchell and, later, Gerhard have called attention to the number of cases beginning in spring in Philadelphia, and the tendency to relapse during this same season. They attribute it to the enervating influence. Later Dr. Mitchell has called attention to the striking coincidence between the curves of chorea occurrence and the number of storm centres passing within one hundred miles of Philadelphia.

In one hundred and eight cases recorded by Gerhard and Mills sixty-three occurred in spring, thirteen in summer, twelve in fall, twenty-one in winter.

In one hundred and forty-six cases I found seventeen beginning in January, fifteen in February, fifteen in March, sixteen in April, twenty-five in May, thirteen in June, eight in July, nine in August, seven in September, seven in October, five in November, nine in December, or fifty-six in spring, thirty in summer, nineteen in fall, forty-one in winter.

The difference here seems to be much more marked between the first and last months than between the seasons, one hundred and one occurring in the first six months, forty-five in the last six months.

RELAPSES.

Wickes believes relapses are most common in winter, and gives statistics to that effect. Relapses were noted in thirty-one cases of this series: one relapse in twenty-two cases, two in four cases, three in two cases, four in one case, five in one case, seven in one case. Of individual relapses in which the date was given, seven occurred in spring, two in summer, three in fall, seven in winter. Fourteen in the first six months, five in the last six months.

ÆTIOLOGY.

As to the causal relation between chorea and rheumatism, in only forty-two is any mention made of its presence or absence. In twelve cases where the time was accurately noted, rheumatism had preceded the attack at intervals varying from one week to six months. In a number of other cases shifting pains in the joints and limbs were mentioned. These are often regarded as prodromata of chorea. If, however, we consider them as evidence of rheumatism, as in children it might be done with considerable fairness, the number would be much increased over the forty-two mentioned above. The occurrence of a cardiac murmur was rarely noted, it apparently not being considered of much import at the time many of the records were made.

In two cases chorea was associated with the puerperal condition; in one of these acute mania was a concomitant. Psychical influences were considered responsible in comparatively few cases. Fright in seven

¹ May 20, 1880, page 484.

association with choreics three, sudden plunge in cold water (fright?) two.

As having a certain bearing on the cerebral localization of the lesion and to a certain extent the embolic theory, the seat of the choreic motion and affection of speech are interesting. Out of thirteen cases in which the speech was said to have been affected, I found the right side was alone affected or became so first and remained the worse in ten. One case is particularly interesting; the movements began on the left side, and were confined there for some days. The right side then became implicated, and simultaneously the speech, which had been perfect before, became much impaired. In three of the thirteen the left side was alone or first attacked. One of these is also interesting: in a previous attack the left side alone was affected, and the speech was much impaired; during the last attack the right side alone was affected, and the speech remained perfect.

In sixty-six the seat of motion was definitely noted: seventeen with right hemichorea, ten with left hemichorea, twenty beginning on right side afterwards universal, but remaining worse on the right, eight same on left side, five universal mostly right, one universal mostly left; one began on left side, became universal, but worse right. Thus fifty were entirely or worse on the right side, sixteen entirely or worse on the left side.

DURATION.

This was exactly stated in but few cases. In twenty-five the average was 94.5 days; in seven of the twenty-five, treated by arsenic alone, it was 77 days. These numbers are, of course, too small to have any value, but are interesting in view of the facts recorded by Gray and Tuckwell, who found the duration of six and twelve cases, treated on the purely expectant method, to be 72 and 73 days, respectively. Gray found an average duration of 75 days in seven cases treated with different remedies, and Tuckwell of 76 days in ten cases where arsenic alone was given.

RESULT.

Three fatal cases occurred in this series.

REPORT ON PROGRESS OF THERAPEUTICS.

BY ROBERT AMORY, M. D. (HARV.), LONGWOOD, BROOKLINE.

THE ACTION OF DIGESTIVE FERMENTS.

M. A. Petit¹ conducted certain experiments upon the digestive properties of ferments, and the following summary contains a pretty fair synopsis of his work:—

(1.) That the best test of the digestive properties of a given ferment are dependent upon the fact of a total transformation into peptones of a determined weight of fibrin.

(2.) The simple solution of fibrin is but a small and insignificant portion of the action of pepsin.

(3.) It is possible to prepare pepsins which have the power of converting a thousand times their weight of fibrin into peptones, and of dissolving in a few hours five hundred thousand times their weight of fibrin.

(4.) Pepsin is a nitrogenous body resembling the composition of albuminoid materials.

(5.) Certain bodies which have a strong action upon alcoholic fermentation and upon the fermentation of diastase, such, for instance, as sulphurous acid, have apparently no peptic fermentative properties.

(6.) There is no equivalent action between the different acids in point of view of their action upon albuminoid matters, some of them being almost inert, such as acetic, butyric, and valerianic acids.

(7.) Most salts have no specific action upon peptic fermentation; some, such as acetates, butyrates, valerianates, phosphates, etc., can, however, assist in the process of digestion by substituting in the formation of hydrochloric acid, and are more or less active according to the amount of this acid produced by the decomposition of their salts.

(8.) Emetics do not act in doses beyond those which are medicinal.

(9.) Alkaloids have no specific action.

(10.) The addition of certain salts in a small quantity (particularly that of sodium chloride) enfeeble the action of pepsin.

(11.) Sugar, even in large amount, does not hinder the action of pepsin; the use of this substance in form of syrup being perfectly rational.

(12.) The digestive properties of an aqueous solution of pepsin are not in the least hindered when a volume of twenty per centum is added to it. If the volume of alcohol is below five per centum, the pepsin will preserve all its activity, will transform the fibrin into peptones and will dissolve rapidly coagulated albumen at a temperature of 42° C.

(13.) Preparations in form of elixirs will preserve for a long time (nearly four years) their digestive properties.

(14.) Upon the principle that a solution of pepsin in dilute alcoholic liquors will retain its action when *agreeably* diluted it follows, in a therapeutic sense, that the proscription of the employment of a pure wine during repast is not rational, and the small quantity of alcohol introduced into the stomach in the form of wine or elixir can be absolutely neglected.

(15.) The alcoholic strength of table wines varies from eight to ten per centum, and sometimes even as low as two to five per centum, according to the quantity of water added. The favorable conditions of peptonic activity are therefore found in this case, and it is unnecessary to explain, as do some experimenters, this apparent innocency in the use of mild wines during repast to the very rapid absorption of alcohol (this absorption taking place in half an hour, and in the case of milk in one hour).

(16.) The substances really incompatible, and which have almost a specific action upon pepsin, are bromine, iodine, chloral, salicylic acid, gallo-tannic acid, and, in a slighter degree, benzoic acid, phenol, or phenic acid.

DIGESTIVE ACTION OF PAPAYA AND ITS ALKALOID PAPAIN ON LIVING TISSUES.²

Bouchut, in continuation of his experiments on the digestive properties of papaya and its derivative papain, which proved that this substance converted proteine materials, such as fibrin, gluten, and milk, into peptones, has found: that the juice of papaya and its alkaloid papain placed upon an exposed brain in a living animal caused the digestion of those portions of the cerebral tissues which were in contact, and that the animal became collapsed in two or three hours, and that the mus-

¹ Journal de Thérapeutique, February, July, 1880.

² Archives Gén. de Médecine, Juillet, 1880.