particularly such as are rich in alkaline salts, and also acid fruits, are permissible. In all cases, however, aside from generalities, individual idiosyncrasies should be noted and the character of the diet arranged in accordance therewith. As regards internal medication, arsenic holds first place as to frequency of administration, and is lauded by Gowers and Weir Mitchell for the treatment of habit spasm. Although Oppenheim considers it valueless in Gilles de la Tourette's disease, I believe I have seen good results follow its use. The author last quoted has as little faith in hyoscine and eserine, although after using the latter he was able to record cessation of movements for several days in one case, but only after intoxication had taken place. One will be compelled to give bromides at times, but their constant use cannot be recommended. When the digestive tract is in good condition and the diet full but judicious, the ordinary tonic mixtures, sometimes largely prescribed, may be dispensed with. In many cases their employment had better be altogether eliminated, as the customary alcoholic menstruum is hardly borne, as a rule. Even in small quantities it may derange digestion and affect mental control. Warm baths and galvanic electricity may be administered for their quieting effect. The skin should be kept active by means of the former; cold sponges may be given where well borne. Some plan of forced nutrition based upon the Weir Mitchell treatment is always indicated, but demands particular vigilance to note that digestion keeps pace with the increased quantities of food consumed. Success in effecting an increase in body-weight will be accompanied by a cessation of the inanition twitchings previously mentioned.

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ANEURISM OF THE CORONARY ARTERY; A REPORT OF TWO CASES.

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THE specimens here described were both kindly given to the writer by Dr. Ludvig Hektoen, and are reported somewhat in detail on account of the great rarity of the conditions.

CASE I.—The subject, a man aged about forty years, was found dead in the street, the autopsy being performed by Dr. L. J. Mitchell. Unfortunately, the body was never identified and nothing could be learned concerning his history.

At the post-mortem examination no evidence of violence was discovered. The brain, alimentary tract, liver, and spleen were normal in appearance. A few pleuritic adhesions bound down the lungs to the chest wall. The kidneys showed the effects of a slight chronic diffuse nephritis. The chief interest centred in the heart and adjoining vessels. The weight of the heart is 300 grms. Externally the specimen presents a rounded eminence, situated over the left auricle, behind and to the left of the root of the pulmonary artery. Upon laying open the cavities the mitral, tricuspid, and pulmonary valves are seen to be normal. The heart muscle is of a natural color. The semilunar valves are thin, translucent, not deformed, and close tightly. Near the base of the aorta and in the sinuses of Valsalva the intima is

FIG. 1.

dotted with a few whitish areas where a moderate degree of sclerosis and fatty degeneration has taken place. These changes, however, are not more marked than is usual at the age of forty-eight. Nowhere is there any deposit of lime salts. The opening of the left coronary

artery is enlarged and irregular. Section reveals just beyond the orifice a dilatation of the artery wall outward, forward, and downward, forming a tumor the size of a pigeon's egg. This sac is nearly filled with laminated blood-clot, leaving a cavity about as large as a hazel-nut. Around the adherent clot the wall of the artery can be traced distinctly. The distal portion of the aneurism communicates with the artery beyond. The dilatation extends to the division of the vessel into its two branches. In the posterior or transverse branch the wall is sclerotic but calcified; the anterior and descending branch is also thickened and its lumen filled with a thrombus. Only slight atheromatous changes are present in the right coronary artery.

Microscopical Examination. Sections of the aneurism were cut parallel to the coronary artery and including its origin from the aorta. Immediately above the orifice the aortic wall is infiltrated, the invasion of round cells apparently starting at a break in the intima and encroaching upon the middle coat. Several small areas of necrotic tissue replace the middle and inner layers of the aorta at the point of junction with the coronary. The thrombus, on the whole, is homogeneous, but in some places is striated. Lining the inner surface of the sac is a thin, irregular layer of relatively recent blood-clot filled with round cells and beginning to organize. The arterial wall surrounding the aneurism is somewhat thickened, and in some places there are streaks or clusters of infiltrating round cells—evidence of inflammation. A cross section of the descending branch of the left coronary exhibits a sclerosis of the wall and a lumen filled with blood-clot, which is pale and stains homogeneously, but is not adherent, and, therefore, probably of post-mortem origin. Such a view is confirmed by the absence of interstitial changes in the heart muscle supplied by this vessel. An interesting condition is found in a section from one of the columns carneæ in the left ventricle. In regions the cement spaces uniting the ends of the muscular fibres are much widened, and more rarely a fibre is itself ruptured, leaving the broken ends rough and lying in a changed direction. This separation and rupture of fibres, known respectively as segmentation and fragmentation, was first observed by Renault¹ in 1877. By many subsequent investigators, and particularly by Hektoen,² in an exhaustive study, segmentation has been found quite constantly in cases of sudden death. The latter author recorded its presence in every one of ten cases of instantaneous death due to traumatism.

CASE II.—Clinical History. J. H. W., a man, aged thirty-nine years, and native born, was admitted to the Cook County Hospital, October 27, 1898. A telegraph operator by occupation, he had for a year previous been employed as an advertising agent. Both maternal grandfather and grandmother died of apoplexy; mother of heart disease. He always smoked and chewed tobacco, and used alcohol to excess. Several years ago he contracted syphilis, and one year ago had a paralytic stroke. His last illness began four weeks before entrance to the hospital, when he noticed numbness and tingling in the legs and feet, and later over the whole body. During this time he had several convulsions. At the time of admission he was having general convulsions of about one minute's duration, at intervals of five minutes.

Physical Examination. Nutrition good. The pupils were equal and reacted. The tongue protruded to the left and was tremulous. There was paralysis of the left facial muscles. Two scars of recent origin were

noted above the left eye; also an old depression. Right radial pulse full and strong, left weaker. Heart sounds loud and irregular. Lungs normal. Left arm and leg partially paralyzed. Temperature, 99.4°; pulse, 124. Uric acid, 1032, faint trace of albumin, granular casts.

The convulsions recurred several times a day, always accompanied by unconsciousness. Subsequently he developed a bronchopneumonia, from the immediate effects of which he died, November 5, 1898.

Post-mortem Examination. Body of a rather slender, well-nourished and developed man. Rigor mortis marked; lividity posteriorly. Mucous membranes of the upper respiratory passages showed no lesion.

The skull and scalp exhibited no changes externally. Internally the right parietal bone showed some fine erosions, corresponding to a circular area of adhesions between the pia and the dura mater. In the adhesions was a grayish-yellow layer of granulation tissue of rather soft consistency, flattened and circular in outline. Around this district the cortex was somewhat softened, but the remainder of the brain, as well as the pons, medulla, and cerebellum, was normal. The vessels at the base of the brain showed nodular and irregular yellowish thickening.

The abdominal, pleural, and pericardial cavities were empty, their lining membranes smooth.

The spleen presented no abnormal appearance. The liver weighed 1400 grms., and cut with normal resistance; it showed some congestion of the centres of the lobules. The pancreas and intestines appeared normal. The kidneys weighed 300 grms. The capsules were adherent in places, and the foetal lobulations were still present. The cortices were rather wider than normal, the markings distinct, the arteries prominent. The testicles were normal.

Over the upper lobe of the right lung were a few firm adhesions. The lungs crepitated, excepting the left lower lobe, which weighed 450 grms., sank in water, and was bluish in color. On the cut surface were numerous grayish-red granular areas, varying in size from that of a split pea to 1 or 2 cm. in diameter. The lung tissue between these areas was collapsed and deep red or bluish-red in color. The remaining parts of the lungs were considerably congested, and the larger bronchi contained mucus. The peribronchial glands were normal.

The heart weighs 550 grms. There is marked thickening of the left ventricular wall. The tricuspid, pulmonary, and ventral valves appear normal. The endocardium is smooth, excepting that the free margin of the aortic valves is rough, thickened, and sclerosed. Just below the junction of the left and anterior semilunar valves is a small bulging in the septum, which admits the tip of the index finger, and is lined with a dense fibrous tissue. Anteriorly the aneurism and the sinus of Valsalva of the posterior pulmonary valve are separated by only a thin partition that is translucent. The "undefended space" situated to the right of this cavity is unaffected. Above the left semilunar valve is a bulging of the aortic wall upward and forward into the loose periaortic tissue, so that the artery is undermined. Bordering on this aneurism is the left coronary orifice, which is of normal size. Immediately beyond the opening, however, is a fusiform dilatation of the arterial wall, large enough to contain a hazel-nut, and extending for the most part posteriorly and to the right. Its walls are streaked with yellowish spots, and in places calcareous scales can be peeled off. Beyond this cavity is a second and smaller dilatation of the right wall.

The beginning of the aorta is very much thickened, the intima irregularly fissured, and similar changes exist throughout the entire thoracic aorta.

FIG. 2.

Microscopical Examination. In the sections the intima is seen to be overlaid by an old thrombus. The artery wall is thickened. Near the orifice the continuity of the intima is broken, and there has been no invasion of round cells. At this point, and in other places within the aneurism, the inner layer has been replaced by calcareous deposits. Some of these calcareous changes extend deep down into the middle coat of the artery.

The heart presents the picture of an extreme myocarditis. The bloodvessels are sclerosed and surrounded by dense fibrous tissue. Some of the muscle fibres are atrophied, some have disappeared, leaving large areas that are occupied by interstitial cells.

Here, also, as in the previous case, there is a segmentation and fragmentation of the muscle fibres.

I was surprised in reading the literature to learn that while aneurisms of the heart and of the root of the aorta are comparatively common, so very few instances of coronary aneurism have been described. The accompanying table comprises all the cases that I could find in which the aneurism unquestionably arose in the coronary arteries.

Both left and right coronaries seem to be involved about an equal number of times. The usual site of the dilatation is very near the origin from the aorta in the loose cellular tissue, so well described by

Vestberg²⁰ as the "perisortic space." This location is also a favorite place for interparietal aneurisms of the heart.

The affection vastly predominates in males.

Age has less influence in the etiology than one would suspect, considering its rôle as a predisposing cause in aneurism elsewhere. More cases were under forty than over that age. A remarkable fact is its occurrence in two very young children.

Occupation is not an important factor, only two subjects being engaged in heavy work. Two individuals gave a history of rheumatism and excessive drinking.

The diagnosis of the lesion was never made during life, since, unless rupture took place, it gave rise to no adventitious sounds, and its location over the auricle did not increase the area of cardiac dulness.

It is doubtful if uncomplicated, unruptured coronary aneurism has any characteristic symptoms. In two cases dyspnoea, cough, and transient pains over the heart were present, but could be better attributed to coexisting bronchitis and valvular insufficiency of the heart.

The disease usually terminates in death from rupture of the aneurism into the pericardium, eleven of the nineteen cases dying from this complication. In the others the aneurism was apparently benign, and was accidentally discovered at autopsy.

Authors.	Sex.	Age.	Occupation.	Cause of death.	Remarks.
Boogoo . . .	M.	—	Soldier,	Rupture into pericardium.	Right coronary, one inch from origin.
Otto . . .	M.	40	.....	Rupture into pericardium.	
Merat . . .	M.	—	.....	Not stated.	Aneurism of small size.
Peste . . .	M.	77	Currier,	Rupture into pericardium.	Left coronary, near origin, small size.
St. Bartholomew's Hosp. Museum.	M.	11	.....	Not stated.	Several small pouches.
Stevenson . . .	M.	—	Soldier,	Rupture into pericardium.	Right coronary, size of walnut, also aneurism of aorta.
Peacock . . .	M.	51	Butcher,	"Bronchitis?"	Left coronary, size of pigeon's egg.
Rristowe . . .	M.	22	Sailor,	Paraplegia.	Both arteries, several small aneurisms; right coronary, size of walnut.
Ward . . .	M.	38	Laborer,	Rupture into pericardium.	Aortic aneurism.
Heuse . . .	M.	21	Walter,	Rupture into pericardium.	Both arteries; multiple aneurisms.
Finnell . . .	F.	25	.....	Not discovered	Right coronary.
Markoe . . .	F.	30	.....	Rupture into pericardium.	Size of hazel-nut.
Clark . . .	M.	30	Walter,	Rupture into pericardium.	Left coronary, near origin.
Ogle . . .	M.	26	Blacksmith,	Rupture into pericardium.	Both arteries, small size.
Nochner . . .	—	—	.....	.....	Left coronary.
Crisp . . .	M.	63	Carpenter,	Rupture into pericardium.	Right coronary.
Malet . . .	M.	5	.....	Rupture into pericardium.	Left coronary.
Hektoen . . .	M.	48	.....	Not known.	Left coronary, near origin, size of pigeon's egg.
Hektoen . . .	M.	39	Telegraph operator,	Bronchopneumonia.	Left coronary, size of hazel-nut.

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A CRITICAL SUMMARY OF RECENT LITERATURE

CONCERNING

THE MOSQUITO AS AN AGENT IN THE TRANSMISSION OF
MALARIA.

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PREVIOUS to the year 1898 little was known concerning the means of transmission of malarin from one individual to another. This subject had occupied the attention of many observers who had devoted much time to the study of the disease. Inoculation experiments had positively proved that malarin could be transmitted from one individual to another by the subcutaneous injection of blood containing living malarial parasites, but there was little evidence pointing to the ordinary modes of transmission of the disease that could be regarded as at all convincing. We were utterly ignorant of the form in which the malarial parasite existed outside the body, and equally in the dark as to the manner in which it entered. The theories advanced were purely hypothetical, and without experimental foundation on which to base them.

The results of experimental work published during the past year have done much toward dispelling the mist that has so long obscured this important problem. The work of Surgeon-Major Ronald Ross, of

the Indian Medical Service, concerning the cultivation of the *proteosoma labbe* (one of the malarial parasites of avian blood) in gray mosquitoes, afforded the first convincing evidence that the mosquito was probably one agent by means of which malarin could be conveyed from bird to bird, and possibly from man to man. The mosquito theory of the transmission of malaria is not a new one. It was first advanced many decades ago, but was first vigorously supported by Manson, from whom Ross received his inspiration to carry out the investigations which have yielded such brilliant results. As early as 1894, Manson¹ suggested that the mosquito might be the intermediate host for the extra-corporeal form of the malarial parasite, just as it is the intermediate host of the filaria nocturna, and that the manner of propagation of the two diseases was analogous. After enumerating several features in which the filaria nocturna and the malarial parasite resemble each other, Manson, at that early date, expressed himself as follows: "The parallel is very complete; the conditions, the requirements, and the problem to be solved are apparently identical for both parasites. As the problem and conditions are the same for both organisms the solution of the problem may also be the same for both. If this be the case, the mosquito having been shown to be the agent by which the filaria is removed from the human bloodvessels, this, or a similar suctorial insect, must be the agent which removes from the human bloodvessels those forms of the malarial organism which are destined to continue the existence of this organism outside the body. It must, therefore, be in this or in a similar suctorial insect or insects that the first stages of the extra-corporeal life of the malarial organism are passed." He believed that the flagellated body was the first extra-corporeal stage of the malarial parasite. He suggested that the flagella, on breaking away from the residual body or pigment-containing sphere, then, by virtue of their vibratory movement, penetrate the cells of some organ of the insect.

In 1896, Manson, in his Goulstonian lectures,² laid especial emphasis on the part which he believed the flagellate organisms played in the propagation of the parasite outside the body. He held that the crescentic body of tertio-autumnal malaria and the tertian and quartan spherical bodies which proceed to flagellation were the "extra-corporeal sporulating homologues of the intra-corporeal spore; that the flagellum is the extra-corporeal homologue of the intra-corporeal spore." Both types of sporulating plasmodium were believed to have corresponding functions, both arising from the same source; one is the germ of the plasmodium inside the human body; the other is the germ of the plasmodium outside the human body; both function in the propagation of the parasite.

Laveran and Manneberg had also regarded the mosquito theory with favor, but had not associated the flagellum with the question of the