them accordingly. Special directions as to spitting, sneezing and coughing should also be a part of the instructions to carriers. Fomites, such as handkerchiefs, spoons, cups and so forth, which have become contaminated by carriers, may infect susceptible persons and should be disinfected or destroyed.

In the prevention of carriers oral and nasal hygiene should be made a part of the daily routine. All faucial or nasal irritation should be inquired into. One way to avert the disease is to keep the teeth well brushed, the mouth and throat as clean as possible and the nasal cavities clear and clean. The public should be taught not to hesitate to gargle or rinse the mouth with a good oral antiseptic; to have no fear of a tooth-brush, and to display no antipathy to a nasal douche, if one is necessary. These measures will in all probability minimize the possibilities of contracting cerebrospinal meningitis when the disease becomes epidemic in any section.

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CONTUSION OF THE CHEST FOLLOWED BY PERSISTENT HEMOPTYSIS AND PRE- SYSTOLIC MURMUR AND THRILL *

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The following case, sent to me in April, 1911, has been under my observation from time to time for nearly six months. It is reported as a contribution to the subject of valvular disease of the heart following traumatism.

The physician who sent the patient to me is a very well-trained and careful practitioner, and had had personal knowledge of the patient for more than six years prior to the accident, had attended his family and had occasionally prescribed for him in trifling ailments. This physician regarded the patient as a healthy man, always able to discharge the duties of an occupation calling for irregular but severe muscular effort, and absolutely free from rational symptoms or physical signs suggestive of disease of the lungs or heart.

History.—G. A. B., aged 36, married, is a lock-tender by occupation and a hearty-looking, stout fellow of medium stature. About the middle of December, 1910, he received, as the result of a boat fouling one of the gates, a violent blow on the left chest from the heavy balance-beam, against which he was leaning, and was thrown to the ground with great force, striking on his breast. He was able to rise but had severe pain in the left side of his chest and symptoms of shock. In a little time he had an abundant hemoptysis, the blood being bright red and frothy and coughed up without effort. There was no evidence of fracture of the ribs. In the course of a day or two recovery from the other immediate effects of the accident appeared to be complete but the blood-spitting continued. It occurred every eight or ten hours for about three weeks and subsequently at longer intervals until this date, April 14, 1911. The attacks came on with a sense of oppression followed by cough and spitting of red, frothy blood. At present there is mucus mixed with blood every morning and two or three mouthfuls of pure blood every few days, otherwise there is no cough or expectoration of any kind. The family history and previous personal history have no bearing on the present condition. It is to be noted that the patient had a mild attack of enteric fever in his early youth and that he has never had rheumatic fever, nor can he recall having had tonsillitis.

Examination. (April 14, 1911).—Patient complained of an inconstant precordial pain which sometimes extended to the left shoulder, especially just before an attack of blood-spitting. There was more or less constant sense of weight in the lower part of the left posterolateral region of the chest. Dyspnea and palpitation were absent. There was a very slight relative diminution of respiratory excursus over the lower part of the left chest with diminution of resonance. The respiratory murmur was normal everywhere with the exception of some enfeeblement in this region and there were no râles. Pulse was small and regular, 80-84; respiration, 18-20; temperature, 98 F. Blood-pressure (Pachon) corresponded to systolic 125, diastolic 80 mm. Hg. The heart was slightly enlarged in its transverse diameter, the apex being about 1 cm. to the left of the mid-clavicular line in the fifth intercostal space. Indistinct pulsation in the second and third intercostal spaces to the left of the sternal border was present. On auscultation the following signs were noted: Faint systolic murmur in the aortic area (not heard at subsequent examination), very faint aortic second sound; accentuation of second sound in pulmonary area; loud, rumbling presystolic murmur accompanied by a thrill, both being intensified by exertion, in the mitral area and to the right of it and a snapping first sound coincident with the palpable impulse. At this time the second sound was not reduplicated. There was no tracheal tugging or other sign of aneurysm; no friction rub or other sign of pericarditis. The urine was normal.

Course.—Oct. 13, 1911: There are small blood-spittings every day and eight or ten large ones amounting to half a tumblerful or more two or three times a week. The presystolic murmur and thrill are more intense and are increased on effort, as in walking. Pulse small, with well-filled arteries, 80 in recumbent, 90 in erect posture. Blood-pressure corresponding to systolic 120, diastolic 80 mm. Hg.

November 15: Very little change in subjective sensations of the patient. He says that he has not lost a pound and that he feels quite well except for the blood-spitting which alone prevents his returning to work. The pain in the chest and shoulder has disappeared. There is slight relative dullness over lower part of the left chest and the inspiratory expansion is less than on the right side. Cardiac dullness at the level of the fifth costal cartilage extends 6 cm. to the right and 10 cm. to the left of the median line. Indistinct pulsation in second and third intercostal spaces to left of sternal border. The systolic murmur in the aortic area is no longer audible and the aortic second sound very faint. There is marked accentuation of the second sound in the pulmonary area with reduplication and a coarse, rumbling, low-pitched presystolic murmur over the body of the heart mesially to the apex, accompanied by a very distinct thrill restricted to the same area. At the apex is heard a faint systolic murmur, which is transmitted toward the axilla. Blood-pressure, systolic 150, diastolic 100. Examination of the blood gave the following result; hemoglobin, 67; red blood-corpuscles, 4,100,000; white blood-corpuscles, 16,600; color index, 0.8+; polymuclears, 66 per cent.; lymphocytes, 25 per cent.; hyaline, 6 per cent.; eosinophils, 1 per cent.; transitionals, 2 per cent. It is important to note a leukocytosis of 16,600.

Examination of the fluid expectorated in the night preceding the patient's visit to me yielded the following facts:

The specimen consisted of 250 c.c. of bloody fluid, partially clotted, neutral in reaction and containing no elastic fibers. Treated with acetic acid it showed a few epithelial cells and numerous leukocytes. Tubercle bacilli were not present in the centrifugated sediment either by the Ziehl-Neelsen or the antiformin method.

Pulse 80, small and regular; temperature at 11 a. m., 98 F.; no dyspnea, edema or other general manifestation of cardiac disease.

Eleven months after the accident the general condition of the patient was the same. The signs of mitral stenosis were more distinct, reduplication of the second sound at the base had appeared and there were evidences of some increase in the size of the right ventricle. The blood-spitting continued and was wholly uninfluenced by treatment. Various drugs had

*Read before the Section of Medicine of the College of Physicians, Philadelphia, Nov. 27, 1911.

been administered in conventional doses, the spirit of glyceryl trinitrate, stypticin, the oil of erigeron, various preparations of digitalis and iron, without effect. Periods of rest in bed had not prevented the recurrence of hemoptysis.

Taken as it now presents itself, the case has the features of a well-developed mitral stenosis with good compensation and a marked tendency to bronchopulmonary hemorrhage. This symptomatic manifestation of mitral disease, especially of mitral stenosis, is much more common than the text-books would indicate. In fact, most of them and some of the special treatises on diseases of the heart do not mention it at all. Among the more recent authoritative statements in regard to the matter are those in the article on mitral obstruction by the late A. E. Sanson,¹ and in James Mackenzie's remarkable monograph on diseases of the heart.² The former writer states, after calling attention to the fact that epistaxis is one of the earliest symptoms to attract attention in this form of chronic valvular disease, that hemoptysis has often been recorded and that it also occurs in the course of the lung affections in this disease, while the latter affirms that "at various stages patients may be seized with great bleeding from the lungs. Here doubtless the cause is the back-pressure in the pulmonary circulation and rupture of the blood-vessels." And he adds, "As a rule this is a grave sign, the patient dying sometimes shortly after an attack." I have never seen this accident and cannot concur in this opinion. On the contrary, hemoptysis in mitral stenosis, though often very alarming, is usually followed by abatement of the cardiac symptoms and sometimes by prolonged improvement. I have recently reported two cases which are interesting in this connection.³

A woman, 52 years old, the mother of four children, consulted me in 1906 for blood-spitting in small amounts, from which she had suffered for ten years. There were well-characterized signs of mitral stenosis. She had never had rheumatism, chorea or puerperal sepsis. There had been no habitual cough and there were neither symptoms nor signs of pulmonary tuberculosis. Tubercle bacilli were not found in the sputa. Her weight had risen from 136 to 150 pounds. She came again, Sept. 22, 1910, stating that she had been entirely free from blood-spitting until May 20, 1910, when she had a single copious bleeding amounting to "at least a quart." Since then she had been well. There were at this recent examination no pulmonary signs whatever and she had neither cough nor expectoration. The signs of mitral disease were the same as four years previously and she complained of slight dyspnea on exertion, but nothing else.

A Jewess, 45 years old, seen in consultation, was unable to recall any attack of rheumatism and regarded herself as well except for some shortness of breath on exertion, which she attributed to increasing weight. Coming home from the theater this patient was seized with profuse hemoptysis, which continued until the following day. There were no signs or symptoms of pulmonary tuberculosis and no tubercle bacilli in the clots, but a coarse presystolic thrill, a loud rumbling murmur at the same period in the cardiac cycle and absolute absence of cough or expectoration after the hemorrhage ceased, which it presently did, showed that it had been due to stenosis of the mitral valve. After several months this patient remained free from hemoptysis.

These hemorrhagic cases of mitral stenosis are very often erroneously regarded as irregular or obscure cases of pulmonary tuberculosis.

With reference to traumatism as a cause of mitral disease, and in particular of mitral stenosis, symp-

tomatic writers are even more silent. The authors in Allbutt's "System"⁴ make, however, the following very positive statement:

Traumatic influences occasionally give rise to the lesions of mitral obstruction. Indirect injury very rarely produces any changes in the mechanism of the mitral valve unless there has been previous disease, but direct violence, such as a blow on the anterior chest-wall, is not a very rare cause of the affection.

Bernstein,⁵ in 1896, collected the reports of cases of heart disease directly following traumatism, 124 in number, but a careful examination of this list shows a very limited number in which the valves were implicated and not one which presents the characters of my Case 1. Stern's monograph,⁶ "Die traumatische Entstehung innerer Krankheiten," contains a limited number of further cases of valvular disease, but none like this one. Riesman⁷ reported a case of mitral stenosis of traumatic origin in which the injury was indirect, being the result of violent exertion on the part of the patient in fleeing from footpads. In most of the cases reported the signs of valvular lesions have been attended by indications of acute endocarditis and in a large proportion the diagnosis has been established or confirmed by necropsy.

In the above case a leukocytosis of 16,600 at this late period and the evidence of a persistent, though gradually subsiding, congestion of the lower lobe of the left lung, probably associated with a low-grade chronic bronchopneumonia, may be invoked to account for the continuing blood-loss in connection with an advancing mitral stenosis.

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SALVARSAN IN PERNICIOUS ANEMIA *

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Miss E. V. (nurse) had been in California, where the diagnosis of pernicious anemia was made. Oct. 10, 1911, the blood examination showed a typical picture of pernicious anemia, with great numbers of megaloblasts, and all the other concomitant features. The red-cell count at this time showed 887,000. Physical examination was negative, except for slight cardiac dilatation. The patient had had large quantities of iron and arsenic before reaching the city. Oct. 10, 1911, 0.3 gm. salvarsan in sesame oil was given in the gluteal region by Dr. Tauber. This was repeated October 18. Hypodermic injections of cacodylate of iron, gr. 1, were then begun and were administered on alternate days, twenty-seven doses being given. The patient's improvement was rapid and, as can be seen from the table, she now presents no evidence of pernicious cachexia. Her diet has been meat-free with large quantities of buttermilk. The blood-picture is now merely that of a mild anemia. Details of the blood-counts can be seen from the accompanying table. It is, of course, too early to pronounce the patient cured; but the changes after the administration of salvarsan were certainly very striking.

Date	R. B. C.	W. B. C.	Hb.	Col. Ind.	Stain Spec.
10/10/11	887,000	7,200	20	1.1	Typical pernicious. Large numbers of normoblasts.
10/23/11	820,000	4,800	17	1.1	
10/31/11	1,060,000	6,000	19	0.8	
11/6/11	2,537,000	6,800	25	0.8	Very few indicated reds.
11/20/11	2,670,000	8,200	45	0.8	
11/28/11	2,900,000	7,400	43	...	
12/11/11	2,820,000	6,800	45	...	
12/21/11	3,200,000	6,400	52	...	

Salvarsan, 0.3 gm., in sesame oil each on October 10 and October 18; on October 27, iron cacodylate, gr. 1, hypodermatically, and every other day thereafter, twenty-seven doses in all.

4. Allbutt's System of Medicine, 1909, vi, 340.

5. Bernstein: Ztschr. f. klin. Med., 1896, xxix, 519.

6. Stern: Verhandl. d. deutsch. path. Gesellsch., 1908, xli, 172.

7. Riesman: THE JOURNAL A. M. A., Sept. 20, 1911, p. 1120.

* Reported before the Clinical Society of the Cincinnati Hospital, Dec. 21, 1911.

1. Revised by G. A. Gibson in the later edition of Allbutt and Rolleston's System of Medicine, 1909, vi, 366.

2. Mackenzie, James: Diseases of the Heart, 1908, p. 226.

3. Wilson, J. C.: Pa. Med. Jour., May, 1911, p. 596.