or ward, and, when supplemented, can be employed for surgical operations.

Note.—Our thanks are due to the medical director and members of the staff of No. — (Lakeside, U.S.A.) General Hospital, who have co-operated in this work. Major Alexander Lambert, Medical Director of the American Red Cross in France, on whose personal staff one of us (J. T. G.) had the pleasure of serving, has in many ways stimulated the working on this problem, and we take pleasure in expressing our warm appreciation of his interest and help.

THE EFFECT OF A DEEP HELD INSPIRATION ON THE MURMUR OF SLIGHT AORTIC REGURGITATION IN YOUNG SUBJECTS.

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I wish to draw attention to what I believe to be an undescribed clinical phenomenon—namely, the marked diminution or complete disappearance of the diastolic murmur of aortic regurgitation (in young subjects with only slight regurgitation) when a deep breath is taken and held.

The well recognized disappearance of a systolic murmur at or near the heart's apex under similar conditions has often been regarded as evidence in favour of such a murmur being exocardial—"cardio-pulmonary" as it has been called—rather than endocardial. Certainly some murmurs, reasonably diagnosed as "cardio-pulmonary," because most audible over areas in which lung tissue overlaps the heart, varying obviously in intensity with the phases of respiration, ceasing in recumbency, not following the usual rules of "conduction" of mitral murmurs, although heard at or near the heart's apex, do disappear when a deep breath is taken and held. But recently I have been led to wonder whether other murmurs, due to real mitral lesions, may not also disappear in similar fashion. Of such I cannot now speak with any confidence, but it is at least interesting to discover that an actual organic murmur like that of aortic regurgitation may also lessen or vanish during deep sustained inspiration. The three following cases have all been seen, and my conclusions verified, by valued colleagues, so that the truth of my observations does not rest on my own unsupported statements.

CASE I.

Pte. G., aged 19, had a well-marked aortic regurgitant murmur whose area of audibility is indicated approximately in Fig. 1. There was no doubt about this murmur; pulmonary regurgitation is an excessively rare condition, and, in my experience (limited to cases of malignant endocarditis), has a murmur well heard over the upper left front of the chest, where this was not heard. The lesion was clearly slight, for the radial pulse was not "water-hammer," and there was no visible pulsation up to the ears in the neck. The heart's apex beat was in the fifth space, a little outside the left mammary line, when the patient was upright, and it was rather diffuse. The limits of the cardiac dullness were:

<i>Standing.</i>	<i>Recumbent.</i>
Right edge: $\frac{7}{8}$ in. to R. of midline	$\frac{3}{4}$ in. to R. of midline.
Left edge: $4\frac{1}{8}$ in. to L. of midline	$4\frac{1}{4}$ in. to L. of midline.

There was no other murmur in any position. Curiously, the weather seemed to make a difference in the effects of inspiration, as I note below. On December 30th, during very cold weather, I noticed that the murmur was almost obliterated when the patient took and held a very deep breath, whether examined in the erect or recumbent position. On expiration the murmur returned. On December 31st, the weather being warm and mild, the deep held breath entirely obliterated the murmur. On January 1st, a warm day, the murmur at the sternal junction of the fourth left rib cartilage was entirely lost on taking and holding a deep breath; in recumbency a sharp reduplicated second sound remained. On January 9th, a warm

day, the murmur was quite lost in the erect position, but not quite lost in the recumbent position, when the deep breath was taken and held.

CASE II.

Driver W., aged 26, admitted August 19th, 1917, with slight aortic regurgitation, and slight double mitral murmur. Fig. 2 shows approximately the area of audibility of the aortic murmur. There was no doubt of the nature of the murmur, there being no murmur heard over or to the left of the pulmonary artery. The lesion was slight, judging by the almost complete absence of pulsation in the neck and the character of the radial pulse.

The diastolic murmur quite disappeared on taking and holding a very deep breath in the erect position, and nearly disappeared in the recumbent position.

FIG. 2—M, Approximate area of audibility of murmur, standing. C, Cardiac dullness, standing. o, Position of stethoscope during observations.

CASE III.

Pte. R., aged 20, admitted November 18th, 1917. I found presystolic and systolic mitral and a soft diastolic aortic murmur. The pulse was not water-hammer, and there was no pulsation to the ear in the neck. On taking and holding a deep breath the diastolic murmur diminished distinctly, not immediately but by degrees, and, on releasing the breath, returned, but more quickly. I believe the same gradual disappearance of the murmur occurred in the other cases also. On November 25th, at the level of the fourth left costal cartilage (showery stormy day) the diastolic murmur quite disappeared on holding a deep breath. On December 1st it quite disappeared, equally in erect and recumbent positions. The condition is illustrated in Fig. 3.

FIG. 3—C, Cardiac dullness, standing. o, Position of stethoscope during observations.

Case I was seen by my colleagues, Dr. Clapp and Dr. Gates; Case II by Dr. Williamson and Dr. Gates; Case III by Dr. Williamson and Dr. Gates.

With regard to possible explanations, mere extra overlapping with lung could not have concealed the murmur, for the second sound, which preceded it, remained quite clear. My idea has been that perhaps the negative pressure set up in the thorax by the deep inspiration partly neutralized the elastic recoil of the aorta, thus lessening the force producing the regurgitation; and that, further, seeing that the effect developed not at once but gradually, the increased volume of the pulmonary capillaries in deep inspiration delayed the entry of blood into the left side of the heart, and produced a rather less full aorta. If these theories are correct they will help to explain the influence (if real) of weather, since on a cold day the aortic tension may perhaps be higher, owing to constriction of surface vessels, than on a warmer day.

It is, however, not to this attempt at explanation, but to the phenomenon itself, that I desire to draw attention.

THE CONSERVATIVE SURGERY OF THE HAND AS ILLUSTRATED BY A CASE OF TENDON GRAFTING.

BY

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It will readily be granted that although the work of the instrument maker in making artificial limbs is excellent, nothing yet invented can take the place of the human hand or even of a thumb and one or more fingers. There are at the present time many cases coming before surgeons doing military work in which the possibility of saving even one finger has to be seriously considered.

The purpose of this paper is to show the possibility of tendon grafting, which I think must have escaped the memory of orthopaedic surgeons, as I have not seen it made use of in any of the hospitals I have inspected