Incised wounds of the joint made by trenchant instruments, as the knife, sabre or scythe, often heal kindly, and are not so invariably followed by traumatic arthritis as in the case of gunshot wounds. Such incised wounds are often made by the Surgeon for the extraction of cartilaginous growths, lying free in the synovial sack. It is worthy of notice, that in these cases the joint and the foreign body are manipulated so as to make the incision into the sack, valvular, to prevent entirely the entrance of air.

In a war conducted as this has been, in a wooded, hilly country, unfavorable to the action of cavalry in their
proper arm, incised wounds of joints have rarely been under the treatment of Surgeons in our service. We find no statements of any such cases in the records of the Surgeon-General's Office, and we presume there are none.

Macleod mentions the case of a dragoon, who was cut across the elbow, of his sword arm, by a Russian horseman, at the heavy cavalry charge at Balaklava. The olecranon was completely detached, and the joint opened. The wound was immediately closed, and the arm placed in an extended position, and cold employed to allay inflammation; little more was done, and the divided surfaces quickly adhered, and an arm remained, which, although not as free in its motions at that joint as it formerly was, yet most useful, and would, I doubt not, become more so in time. Other cases are mentioned by authors on military surgery, in which the joint had been opened by incised wounds, and those produced by sharp-pointed stylet-shaped weapons, rapidly uniting, when at once closed and the air perfectly excluded.

Shell wounds of joints in many cases, are of the nature of incised wounds, but can hardly be treated as such. In some cases, when the bones and articular cartilage are not injured, and the wound in capsule is large enough to permit of the free outflow of the fluids secreted, they do well and heal with ankylosis.

But one instance of incised, or rather it was a penetrating wound, produced by a sharp spike of glass, has come under our observation during this war. A medical officer being at dinner in a room on the ground floor had occasion to leave the room. He stepped out of the window on an iron grating, which gave way and precipitated him into an area some eight or ten feet deep, on some rubbish and broken bottles. He fell upon his knee; beyond the general discomfort that would ordinarily be produced by such an unexpected descent, he experienced neither
pain nor annoyance. In a short time he walked up to the Capitol Square, to see the evening parade and listen to the music of the band; and at that time, whilst resting on one of the benches, he first felt pain in the knee. This was not acute enough to direct his attention especially to its condition. After parade he walked to his room, say one-half mile off; his knee now became very painful, and medical aid was solicited. Two hours after the fall, he was found in his bed in a state of great alarm, and stated that he had a piece of glass in his knee-joint. On examining his knee, a small opening of about a quarter of an inch was found just below the under edge of the patella in the line of the joint on the outer side; no synovia had escaped from the wound, nor could any connection with the interior of the capsule be detected. Passing the finger carefully over the articulation, a small, unnatural, projecting point was detected, more than an inch below the wound, in the skin. The skin was carefully drawn down, so as to make the wound correspond to the projecting substances, and with a fine pair of forceps, a wedge-shaped piece of crown glass, an inch long, was extracted; a few drops of synovial fluid, streaked with blood, followed this. The skin was at once allowed to return to its normal position, and the lips of the cut were nicely adapted and hermetically sealed by adhesive plaster. The leg was fixed so as to prevent all motion of the joint, and he was removed to General Hospital No. 4, for treatment. The articulation was kept cool with a solution of muriate of ammonia in whiskey and water; morphia was administered to procure sleep, and absolute rest directed. No inflammatory action ensued; there was little fever, and no pain worth mentioning; there was some tenderness upon pressing over the joint. The wound healed readily, united without suppuration, and in six days the patient was able to bend his knee and exercise.
In wounds of this character we are then encouraged to hope for the best results, and that there will be no loss of the motion of the articulation.

The treatment consists in the speedy and perfect adaptation of the edges of the wound through its depth, as far as possible, by compresses on each side of it. The wound should be perfectly closed, to the total exclusion of the air, by collodion; or if this be not at hand, by adhesive plaster, varnished over as advised by Mr. Abernethy, with a solution of sealing wax in spirits of wine, which hardens in a few minutes. The solution of gutta percha in chloroform would answer a better purpose, as it will not crack and fissure. The joint must be carefully adjusted in some immovable apparatus, so that the edges of the wound may be kept perfectly adapted, and such means must be employed as to restrain the hypersecretion of the synovial fluid, which will certainly come on with the increased action in the vessels of the wounded part.

Bleeding, general and local, and the constant application of cold to the part, must be resorted to, for we must bear in mind that if this inflammatory action be not restrained, the life of the patient may, or rather will, be placed at hazard.

If, despite all our efforts to the contrary, the joint becomes painful and swollen; if rigors and high constitutional excitement supervene, we suggest that the joint should be freely incised, and then treated as other wounds of joints in which traumatic arthritis exists.

John Bell says we may take the united experience of all Surgeons, which has established this as the true prognostic, that "wounds of joints are mortal." The diction of so great a man and distinguished Surgeon, although not really correct, will show how serious such injuries are; how grave the "prognostic," and how much anxiety
they should excite. We, at this late day, after the experience of the recent and present wars, are probably better instructed as to the treatment of such injuries; and as a rule, there are probably no wounds in the body occasioned by the accidents of war, in which so much is to be expected from the skill of the Surgeon, and from the exertions of which such favorable results follow; or on the other hand, if he have not such skill, or having it, neglect to employ it, for the benefit of the patient, no class of wounds are more mortal.

Wounds of the orbicular are not of so serious a character as those of the hinge-joints. Their less complexity of structure accounts for this. The results of joint wounds in the upper and inferior extremities differ, owing to the less size of the articular facets of joints of the same character, and to the same law of nearness to the centre of circulation which governs the result of wounds and injuries and of amputations in the two extremities. The larger joints of the superior extremity may get well, as far as the closing of the wound is concerned, but with ankylosis and deformity. It is rare for the two larger joints of the inferior extremity to recover without aid from the Surgeon. No cases of recovery from wounds implicating the hip-joint are noted in our records, save where the resection of the head of the femur has been employed. The experience of Surgeons of the Allied army before Sebastopol was unanimous that all cases where the knee-joint was distinctly known to be injured were fatal, when amputation was not resorted to. Macleod states that in 1854 he saw forty cases in the French Hospital, and all died except those primarily amputated. In the Indian reports, the same gentleman found nine cases in which the knee was penetrated, and the injury so slight as to induce attempts to save the limb, and yet all died. Alcock has stated the proportion of
cases in which the articulation was wounded, to other gun-shot wounds, as between four and five per cent., nearly one-half of which were in the knee. Out of thirty-five cases in which the knee was more or less implicated, twenty-two lost their lives, and eight their legs. After such results, he says it is little to say, that the five who recovered preserved good and useful legs.

We have forestalled, the discussion of injuries to the joint, in order to explain the extraordinary record we have before us, compiled from the data in the office of the Surgeon-General. These records give, in regard to this special joint, statistics far different from any ever before published.

<table>
<thead>
<tr>
<th>No. of Cases</th>
<th>Should'r</th>
<th>Elbow</th>
<th>Wrist</th>
<th>Hip</th>
<th>Knee</th>
<th>Ankle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recovery</td>
<td>17</td>
<td>52</td>
<td>25</td>
<td>9</td>
<td>99</td>
<td>29</td>
</tr>
<tr>
<td>Ankylosis</td>
<td>11</td>
<td>47</td>
<td>23</td>
<td></td>
<td>45</td>
<td>27</td>
</tr>
<tr>
<td>Motion</td>
<td>5</td>
<td>32</td>
<td>25</td>
<td></td>
<td>40</td>
<td>10</td>
</tr>
<tr>
<td>Deaths</td>
<td>6</td>
<td>2</td>
<td>2</td>
<td>8</td>
<td>54</td>
<td>8</td>
</tr>
<tr>
<td>No result</td>
<td>6</td>
<td>13</td>
<td>12</td>
<td>14</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Cases still under treatment*</td>
<td>8</td>
<td>7</td>
<td>2</td>
<td>1</td>
<td>24</td>
<td>9</td>
</tr>
</tbody>
</table>

*Of which the result can only be surmised. Those of the knee and hip are reported as doing badly.

INCISIONS INTO THE CAVITIES OF JOINTS.

<table>
<thead>
<tr>
<th>No. of Cases</th>
<th>Should'r</th>
<th>Elbow</th>
<th>Wrist</th>
<th>Hip</th>
<th>Knee</th>
<th>Ankle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>2</td>
<td>11</td>
<td>10</td>
<td>25</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Secondary</td>
<td></td>
<td>3</td>
<td>3</td>
<td>17</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Time not stated</td>
<td></td>
<td>8</td>
<td>7</td>
<td>6</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Deaths</td>
<td></td>
<td>1</td>
<td></td>
<td>14</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Recovery</td>
<td>2</td>
<td>5</td>
<td>8</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Under treatment</td>
<td></td>
<td>5</td>
<td>8</td>
<td>9</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

The appearance of the external wounds give no indication in many cases of the actual damage sustained by the articulation. In some cases that have come under our observation the position of the orifice of entrance and exit of the bullet, and the absence of pain in the joint, and the patients stating that they had used the limb after the injury, and in cases of knee-joint wounds, having walked some distance, we did not suspect any serious injury to the articulation; yet subsequently traumatic
arthritis, with profuse suppuration having been established, the joints have been opened, and great destruction of the ends of the bones entering into the formation was found to exist.

It is a fact well established by the experience of most Surgeons conversant with military surgery, and fully borne out by the records we have consulted, that at a variable period after the reception of the wound, the joint becomes inflamed, and profuse suppuration comes on, and that at this time severe and dangerous symptoms set in. We find only the records of a single case in which this result did not come to pass, in which a wound through the elbow healed speedily without suppuration. Reported by Surgeon Habersham, of Chimborazo. This case can only be explained by the small size of the ball, and its having passed through the joint at its greatest possible momentum, thus making a clean cut through without injury to the articular cartilage or the bone. It may be also in this case that the change of position in the limb, after injury, permitted the skin to cover up the wound in the synovial sack; or again, the sack itself may not have been penetrated, and the ball taken an outer course around the joint itself; for the description of the case does not mention more than the wound and the result.

The length of time that in many cases intervenes between the reception of the wound and the beginning of the suppurating stage, is a source of great danger. From the description already given of the course pursued by traumatic arthritis, and its destructive effects on the articulation itself, we can readily conceive that this may be the brooding time for great detriment to the patient. This arthritis must ensue, sooner or later, when the air is admitted to the synovial membrane, which is always the case in gunshot wounds of these parts. When this condition is established, we think but one resource
remains to us, in order to preserve the patient's life. The joint should be fairly opened, and a free vent given to all the retained and fetid purulent matter contained in it. It should then be kept clean and free from all such collections, by frequent injections of lukewarm water; and a suitable immovable apparatus, if not already in use in the case, should be at once adjusted to the limb. If sinuses and burrowing of pus, have been permitted to form in the adjacent tissue, by neglect in not opening the joint in time to prevent these, they should also be washed out, and injected by some agent that will modify the diseased action in the parts. For this purpose, Tinct. Iodine in water has been highly recommended. Of late years the Tinct. of Coal Tar has established for itself a reputation with the French Surgeons in the treatment of these cases. It is claimed for this preparation, that it destroys the feter of the secretion, and modifies and diminishes the amount of pus. The walls of the sinuses should be compressed together by suitable bandages, and kept empty, as far as may be, by position.

When this destructive process has once been established, it goes on to the complete destruction of the articular cartilages of the joint, and in some cases induces inflammation, and subsequent necrosis of the bone. The question naturally arises: are we quietly to await the destructive traumatic arthritis which invariably comes on in bullet wounds of joints, induced by the constant contact of air and pus from the tract of the missile, with its attendant disintegration of the cartilages and disease of the bone? In many cases, indeed we may say in all cases, when the large joints, as the knee and hip are implicated, this leads to the setting up of hectic fever, and the death of the patient; or can we forestall the condition by operative interference? As this state of things so destructive to life always comes on,
why should we not open the joint at once by free incisions, and expose the whole of its cavity? By this procedure the fibrous investing capsule and the tough ligament of the joint will be freely divided, all irritant discharges will find vent, and more than this, a correct knowledge of the actual injury the parts have sustained will be come at, and we can then sagaciously determine what subsequent treatment ought to be pursued in the case. No injury can be done either to the part or the patient, for we at once place the articulation in the condition it must invariably come to at some subsequent period, and this too under more propitious circumstances. The patient will be stronger, and better able to resist the profuse discharge that will ensue at this time, than if he waits for a week or more, and the articulation will be opened before these discharges have had a chance of forming and producing deep burrows in the tissues around. In this way much suffering and great constitutional irritation will be avoided.

The incision into large joints immediately after the receipt of the injury, has been strongly advised by Macleod in cases of penetrating ball wounds of the knee-joint; and as this is a joint injury frequently followed by loss of life, when treated on the expectant plan, the advice will with equal force be applicable to wounds of other articulations. It has also received the sanction of Stromeyer, who in the Schleswick-Holstein war, once opened the joint with satisfactory results. We have not had an opportunity of putting this in practice, but for the reasons given, would certainly do so, should the opportunity present itself. [During the campaign of '64, this practice was freely resorted to by myself and others, with encouraging results.] Some primary incisions have been made in Atlanta, Ga., by Surgeon Westmoreland, but the result of the cases at this time have not come to
hand; at last report they were doing well. The synovial sack and the articular cartilage will be destroyed, but this invariably occurs when the articulation is entered by a ball, and in this case the disintegrated detritus will have free outlet, and not be pent up by strong unyielding tissues.

In civil practice, in some of the diseases of these closed sacks, the serous cavities, we are in the habit of injecting Iodine and such allied remedies, with the avowed intention of creating a new action in them. Now would not good accrue in the joint cases, where only incision has to be practiced, and the endeavor of the Surgeon is turned solely to the producing ankylosis from destroying the synovial membrane at the time this primary incision is made by caustics of some suitable kind? The total removal of that membrane is recommended in cases of resection of the joints. By the caustic treatment, we will get clear of much profuse discharge from this membrane which it rapidly secretes, until life is destroyed by the violence of the inflammation excited in it by free contact with air. After this invasion the limb should be fixed, as indeed is advisable in all joint injuries, and should be constantly cleansed from all irritant secretions. The antiphlogistic treatment should be rigidly enforced.

We have in confirmation of this method of treatment cases in which the wrist and ankle-joint have been freely incised to facilitate the removal of spiculae of bone; as a rule, these cases have resulted well. We are not prepared to state that the employment of passive motion in these cases, where the articulation is opened and the ends of the bones not injured would not restore partial motion to the articulation, for we are aware of cases from disease, where the articular cartilages have been eroded; the bones hardened and eburnated in their facets, in which the joints were moderately useful.
Incisions into articulations, with the results, will be found in the table appended to this report, and just read. Different results are to be desired and sought for in the superior and inferior extremities. An ankylosed joint in the one is almost useless, and in the other is next to perfect motion, the best result that can be hoped for—giving good and useful support to the body, infinitely better than any artificial appliance.

It is not proposed in this report to discuss the merits of amputation and of the efforts to save useful limbs. In the arm, experience in this and other wars has amply proven that not only is the operation of resection of its articulations less fatal than amputation of the part, but that there often result false joints of great use to the individual. If, then, the main blood vessels and nerves are uninjured, in these joint wounds, amputation should not be resorted to. In his decision on this subject, the surgeon should be guided by circumstances. The general health of the wounded man, the amount of fatigue he has previously undergone, his freedom from scrofula or secondary syphilis, and his "surroundings," or in other words, the conveniences for subsequent treatment of the cases; and last, but not least, in the chain of circumstances, the amount of injury to the soft parts must be taken into serious consideration. In superior extremities, in most cases where the main vessels are uninjured, the effort to save the limb and form an artificial joint, should always be made, if no impediment to a successful result exists in the patient himself.

The injury inflicted on the bone, and the amount of it shattered will always influence the decision. Where, from the result of experience, we are led to hope that artificial joints may be formed, this is not of so much moment. But in those joints where we desire ankylosis, any great extent of destruction, extending through and
beyond the epiphysis of the bone, would at once necessi-
tate the resort to amputation.

In the shoulder, as many as six or seven inches may be
abluted, and a limb remain of great utility, with perfect
use of the forearm, and a certain power of contracting the
loose tissues that hold the lower portion of the bone in
connection with the shoulder. This is beautifully exem-
plified in a case reported by Assistant Surgeon Wilson,
of Camp Jackson hospital. In this case the motion of the
forearm is perfect, and when the patient had a splint
bandaged on to the arm and shoulder, slight power of
bringing the arm forward over his chest. Six inches of
bone had been ablated in this case, and no contraction, or
very little, had taken place. The arm could be twisted
round on itself, yet there was some little power in the
muscles that had attached themselves to the skin in fixing
the forearm. This case has been reported at length in
the C. S. Journal, and is doubtless familiar to all. In the
elbow a considerable portion of the humerus may be ex-
cised and a useful joint remain, and so long as the
attachment of the biceps remains to the radius, there
seems to be no limit to the amount that may be removed.
We have had under observation a case in which the
distance between the ends of the bones was four inches,
and the arm was strong enough to raise a bucket of
water. In the wrist the importance of preserving, if
possible, the use of the hand and the play of the finger
muscles, induces us in most cases to attempt its preserva-
tion by resection of the carpal ends of the radius and
ulna, and even of portions of the carpal bones.

The question with regard to the Coxo-femoral articula-
tions hardly admits of a doubt. It is either between
certain death or possible recovery, that the selection is to
be made. The records before us and those reported by
surgeons in other wars, teach us that all wounds impli-
cating this articulation, and treated on the expectant plan, without surgical interference, are fatal. Hardly a better result than this can be said to follow from amputation at this joint; an exceptional case may recover, but we must not be governed in our decision by results of this kind, that are, from their rarity, almost miraculous. Resections of this joint, during this war have as far as our information goes, been made three times, twice in the Confederacy, and once by a Federal surgeon on the person of a Confederate soldier. Two of these cases recovered with useful limbs; the third case was unsuccessful; the condition of the part, owing to over work and to the crowded state of the wards of the hospital were not recognized until the strength of the patient was sapped too far. But even in this case the excruciating pain experienced by the patient was entirely relieved, and he sank quietly and painlessly to his grave. In the Crimea, all cases of this wound, not treated by resection, died; and of the six resected, one lived, with a useful and strong limb.

The operation of resection in penetrating wounds of the knee joint have not generally found favor with military surgeons. The size and complexity of the articulation, and the absolute need of perfect and continuous adaptation of the divided ends of the femur and tibia, and the wearisome length of time requisite for the treatment of the case, have always induced them to resort to amputation in the lower third of the thigh. So few resections of the knee joint have been accomplished in our service that no facts can be deduced from them; of course the most desirable result in these cases is bony union in such a position as to be useful to the patient for walking; for this purpose bony or strong fibrous union, which finally may change with time, is sought to be obtained. The difficulty of this perfect adaptation and
retention of the ends of the bones in apposition, we hope to do away with by the method to be described, when treating specially of resection of this joint. It seems to us that as this operation of resection of the knee has resulted so favorably in civil practice, it is well worthy of a more extensive trial than has been accorded to it in this war. Macleod mentions but one resection of this joint in the Crimea, and this went on favorably, and partial union took place between the divided bones; the discharge diminished in quantity, and the external wound looked healthy, and had nearly healed across the front. The restlessness of the patient, naturally a reckless person, caused some difficulty in preserving the immovableability of the limb. This patient, after doing well for some time, succumbed under an attack of diarrhoea and vomiting. He had not the appearance of a man suffering with pyæmia, but seemed simply to die exhausted by sickness and diarrhoea.

The chairman of this committee has resected the knee joint three times during the war, with two deaths and one cure. The fatal cases were secondary, and when the operation was made, were suffering from the exhaustion of profuse suppuration. The resection was selected in preference to amputation, which, from the disorganized condition of the thigh, would have been made in the middle third as a less grave procedure, and one in which there would not be so much shock or nearly so great a loss of blood; the patients also strenuously objected to amputation. Had they been submitted to amputation they would hardly have left the table alive. The cases resulted fatally, but they lived and suffered so slightly from shock, and had so light a reactive fever, that great encouragement was felt to resort to such operations in future, especially as secondary amputations of the thigh for knee joint injuries had
resulted fatally. In the other case, the operation was secondary to the reception of the injury, but primary as to the condition of the joint and synovial membrane, for traumatic arthritis had just manifested itself, and no suppuration had yet taken place in the articular cavity. The patient recovered in one hundred and twenty days; the external wound was closed, the cicatrix was firm, and no sinuses existed. There was firm fibrous union of the two ends, which in time will doubtless ossify. The want of osseous union at this time results from several causes. The necessity that existed of changing the apparatus used, which was constructed hastily, on the 4th or 5th day of the treatment. By this movement the precise adaptation of the ends of the bones was interfered with, and some granulations injured, as was shown by a hemorrhage, that came on soon after, for at this time the granulations could be seen cropping out from the two bones. The result of this case is encouraging. A full report has been sent to the Surgeon General.

These operations in joints should always be primary, or if secondary, after suppuration has been fully established and the system has become somewhat accustomed to the injury it has received. Intermediary operations are inadmissible. Interference at any time during the stage of acute arthritis, except to let out the putrid contents of the synovial sack, will only increase the constitutional disturbance. After the seven days' battles around Richmond we saw two fatal results from excision of the elbow joint, during the intermediary stage. We must in such cases see that free incisions are made to let out the secretions, and quietly bide our time for interfering. It is established by the records of military surgery that all excisions of joints should be complete, that is, all the articular cartilage in the joints should be ablated, and experience teaches us that better cures in cases result
when this is done, for the cartilage, if not removed by the operator, must be always, by a much slower and more tedious process, that of disintegration from want of nutrition. In joints where motion is preserved after these resections, the ends of the bones become rounded off and covered by a strong fibrous envelope.

<table>
<thead>
<tr>
<th></th>
<th>No. of cases</th>
<th>Primary</th>
<th>Secondary</th>
<th>Deaths</th>
<th>Per cent</th>
<th>Cases</th>
<th>Deaths</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baudens</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>7</td>
<td>47.1</td>
</tr>
<tr>
<td>Schleswick Holstein War</td>
<td>19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>7</td>
<td>47.1</td>
</tr>
<tr>
<td>CRIMEA</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>36.9</td>
<td></td>
</tr>
<tr>
<td>English Army</td>
<td>38</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>21</td>
<td>55.3</td>
<td></td>
</tr>
<tr>
<td>French Army</td>
<td>66</td>
<td>41</td>
<td>13</td>
<td>25</td>
<td>41</td>
<td>120</td>
<td>45</td>
<td>29.6</td>
</tr>
<tr>
<td>Confederate States' Reports</td>
<td>246</td>
<td>180</td>
<td>7</td>
<td>29.06</td>
<td>246</td>
<td>66</td>
<td>29</td>
<td>29.6</td>
</tr>
</tbody>
</table>

The results of these operations are very satisfactory. The hand preserved most of its movement, and the arm in many cases could be moved slightly forward and backward, there was little power, however, of abducting the arm, owing, we surmise, to most of these cases having been performed by the circular section through the deltoid. There can be found in our own records many cases reported as resected, in which no result has been given; those, of course, have been omitted in the report. Comparing the result of these cases with that of wounds of this articulation treated without excision, we find seventeen; three cures, six deaths, and five useless ankylosed limbs, and six cases in which the result is not stated. The percentage is less than that given for amputations at the shoulder joint, and has the advantage of leaving a most useful member.

Gunshot wounds of the Scapulo-humeral articulation are to be resected in all cases in which the head of the bone is injured, and the blood vessels and nerves that pass to the arm are intact. The glenoid cavity and the
head of the humerus, if injured, should be resected at the same time. These resections are usually partial, that is to say, the articular cartilage is not usually severed from its adhesion to the scapula. It is difficult to place a limit to the length of the piece of the humerus that may be taken away and still a limb useful for many purposes remain. In the reports of cases we find that as many as six inches have been ablated and good results obtained. We refer again to the case reported by Dr. Wilson as in point.

In the cases we have examined, some time after the healing of the wound, only a to and fro motion could be given to the arm, and no elevation from want of a fixed point for the humerus to work against. Desault says, "The simplicity of an operation is its perfectness." Various incisions have been, and are, employed by surgeons in the performance of this resection; many, after Stromeyer, make a semi-circular, horse-shoe-like, cut through the deltoid, severing the muscle entirely in two; others prefer the simple vertical incision through the deltoid, extending from the acromion as far as such case may require, and if this be not found sufficient to permit the head of the bone to be dislodged from the glenoid cavity, from the lower edge of this incision another may be made, carried backwards and upwards, making a posterior flap with its apex downwards. In our opinion, much of the subsequent utility of the arm will depend upon the incision made, so as to expose the articulation.

The single vertical incision certainly possesses advantages over any other, for if the bone be sawed through above the insertion of the deltoid muscle, by avoiding the transverse section of its fibres, we preserve all the power of the contraction of the muscles, and have the end of the bone drawn up to the glenoid cavity. Stromeyer's statement, that the lower portion of the cut deltoid attaches
itself to the glenoid cavity, is not sustained by our observation.

We have had the opportunity of examining many of the resections of the shoulder, performed both by the curved section across the fibre of the muscle, and the straight one, made longitudinally with its fibres. The difference in these cases was striking.—The curved incisions leave a large, deep, ugly cicatrix, which has a tendency to ulcerate by the rubbing of the patient's clothing; there was no attachment of the muscle to the head of the scapula, but all the muscular fibres seemed to run into the cicatrix; the shoulder was flat, and the acromion prominent. The deltoid was evidently atrophied. Where the vertical cut had been used, the arm was shortened, if the section was not below the insertion of the deltoid muscle. The roundness of the shoulder was better preserved, and the cicatrix instead of being exposed was depressed and protected from pressure. Some stress has been laid, that the line of the incision should, if possible, include the wound or wounds; this, we believe to be of minor importance. In a case of secondary resection of the shoulder, performed at General Hospital No. 4, a single straight incision was made, and neither the orifice of entrance or exit were included, and the head and one inch of the humerus removed. The lips of the wound were nicely adapted with ordinary sutures. The wound healed by the first intention; the discharge from the joint continued from the wound of exit, situated behind. The case resulted happily, and there remained a most useful limb. When the patient was discharged he had slight use of the deltoid, in abducting the arm. I have no doubt much more power was subsequently developed by time and use.

In all resections of joints, we think it highly injudicious to compress the main artery, for by so doing we deprive
ourselves of the important knowledge of its locality, communicated to the fingers by its pulsations, while we are dividing tendons and muscles in its vicinity; moreover, secondary hemorrhage is one of the most usual accidents that follows resection. By thus compressing the main artery, the articular and circumflex branches divided, do not bleed, and the subsequent handling of the part, during the operation, prevent their spurting when the pressure is removed, and thus they are not ligated, and when reaction comes on start afresh.

The operation itself is simple and easy, a straight incision is made of the required length for the acromion, down to the head of the bone, and as far as needed along the shaft, by one cut of the scalpel the parts are easily separated. The long head of the biceps pushed inwards out of the way, the capsule is opened, and the head of the bone dislocated by manipulating the arm, or if this be impossible, by seizing the upper portion of the bone, with the lion forceps—all spiculae of the bone, are now to be carefully picked out of the wound. The upper and lower part of the incision may now be closed with sutures, and if there be a posterior wound, the whole line may be closed, and an attempt made at union. A soft pad well covered with oiled silk, or rubber cloth, should be placed under the arm from the axilla to the elbow, and the arm and forearm, then bandaged closely to the chest when the wound has nearly healed up again, motion must be resorted to.

RESECTION OF THE ELBOW JOINT.

<table>
<thead>
<tr>
<th></th>
<th>No. of cases</th>
<th>Primary</th>
<th>Secondary</th>
<th>Deaths</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shleswick</td>
<td>40</td>
<td></td>
<td></td>
<td>6</td>
<td>15.0</td>
</tr>
<tr>
<td>English Army</td>
<td>20</td>
<td>13</td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Crimea</td>
<td>.</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Partial recovery</td>
<td>45</td>
<td>22</td>
<td></td>
<td>3</td>
<td>25.5</td>
</tr>
<tr>
<td>Confederate States Reports</td>
<td>20</td>
<td></td>
<td>23</td>
<td>6</td>
<td>30</td>
</tr>
</tbody>
</table>
The results of the operation are highly satisfactory, for if useful joints do not always remain, the ankylosed joint can always be placed in the position that renders it most useful to the patient, and the perfect use of the hand is preserved. Both articular facets should be removed, for although good joints have followed partial resections of the elbow, the experience of surgeons runs, that complete resections heal more rapidly and are attended with better results. Macleod states: "Partial resections, of which there are a great many cases, did not, I think, turn out as well as complete ones; they were more tedious, more liable to fail, and less satisfactory when they succeeded, than when the whole articulation is removed." In these cases it is proper to remove more than the articular facets, although they alone be injured, in order to prevent ankylosis; a large extent of bone may be removed from the lower end of the humerus, but of the radius, if possible, the insertion of the biceps should be preserved. The vertical incision fulfills all the indications required; it should be free, and made directly through the tissue at the back of the joint, at one cut, down to the bone, the soft parts should be carefully cleared away, and the ulna nerve sought for and pushed out of its groove to the inner side. Wounds of this nerve may be followed by atrophy of the forearm, and at least will be attended with less sensation of the little and ring finger. The ordinary care of protecting the soft parts and vessels from the saw must, of course, not be omitted. Stromeyer states that the joint should now be fixed on a splint and not be removed from this whilst being dressed, and it must be elevated so as to prevent oedema of the forearm; it must be flexed at an angle of 130° to 140°.

Early passive motion must be resorted to as soon as suppuration has diminished, and before cicatrization is complete. Little reaction ensues in these cases; cold
dresses should be applied as long as the condition of the part indicates their use. By judicious after treatment an amount of motion is obtained but little inferior to the natural joint. In the fifth volume London Lancet, page 231, 1855, Mr. Syme reports the appearance of an elbow joint nine years after resection. The ulna was found united to the humerus by ligament, the end of the radius was polished off and played on the ulna and humerus, a material something like cartilage, being interposed. The ends of the bones of the forearm were locked in by two processes, projecting downwards from the humerus, and posterior ligaments bound them to the latter bone. Mr. Robert states, in these cases, that flexion is a compound movement, the forearm being first drawn up to the humerus by the triceps and then flexed by the biceps. This action we have observed in three cases that we have examined two years after operation. In some cases flexion cannot be made unless the arm be fixed by a weight in the hand.

**RESECTIONS OF THE WRIST.**

<table>
<thead>
<tr>
<th>Sorrel's reports</th>
<th>No. of cases</th>
<th>Primary</th>
<th>Secondary</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Cases of gunshot injury of the wrist joint requiring resection are of rare occurrence. In the majority of cases the enlargement of the wound for the removal of shattered bone suffices, as for this purpose lateral incisions on the outer side of the bones may be made, through these incisions the ends of either the radius or ulna may be turned out and cut off with the saw or bone pliers. When we take into consideration how closely the tendons are bound down by the annular ligament, we will at once recognize the extreme difficulty of pushing them out of the way of the saw. Legouest and others, on this account, and because of the stiff and useless state of the fingers
that remain, advises against the operation. We have ourselves no experience thus far, and find nothing in the surgical reports bearing on this subject. Should this operation be performed, great attention should be given to the early use of passive movement, so as to keep the tendons from forming adhesions.

**INFERIOR EXTREMITY “HIP JOINT.”**

<table>
<thead>
<tr>
<th></th>
<th>No. of cases</th>
<th>Primary</th>
<th>Secondary</th>
<th>Deaths</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crimea</td>
<td>6</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>83.3%</td>
</tr>
<tr>
<td>Sorrel's reports</td>
<td>3</td>
<td></td>
<td></td>
<td>1</td>
<td>33.3%</td>
</tr>
</tbody>
</table>

We find upon recurring to our table of wounds of the joints treated by the expectant plan, that eight cases thus treated died, and that there were no recoveries. This was also the experience in the Schleswick Holstein war, and in the Crimea. Three cases in the present war were submitted to resection, two with admirable results, and the other, although terminating fatally, with great temporary relief to the patient. Looking at these facts, and at the almost equally fatal results of amputation of the coxo-femoral articulation, we must come to the conclusion that when the head of the femur is injured by a ball, the only chance of the sufferer lies in prompt resection of the joint. The useful limbs that are retained after this operation would, other things being equal, give it the call over amputation, and the expectant treatment, which at best, could only result in an ankylosed joint, with sinususes from carious bone. In the Crimea, O'Leary's case recovered with a very useful joint.

Of the two cases reported by the chairman of this committee, one recovered after the resection of the head of the femur and over six inches of the shaft of the bone. As will be seen by a letter just received, and part of which is now submitted to the association, his limb is near six inches short, but has tolerable motion and strength. The other case will be found reported in the journal, and must
be familiar to all, as the person has been seen by many, walking about the city with a useful leg. Jarret promises to be in Richmond early in May, and if possible, will be presented to the association for examination. The case that resulted fatally has also been reported.

An analysis of the cases in the Crimea, quoted by Macleod, shows that of the five cases that died, two died from exhaustion, one from pyæmia, one doing well up to his seizure with Asiatic cholera, at that time prevalent in the camp, and one from some cause unknown. Another remarkable fact, perhaps worthy of note, is that in but one of these cases was the capsule of the joint opened, or did the fracture extend to the ephysis of the femur. The same condition existed in Jarret's case. In the case of Tony, who died, the ball was in the cotyloid cavity, between the head of the femur and its wall. This case was noticeable from the extreme pain that existed in the whole leg, until after the head of the bone and the ball were removed, the articular cartilage in the cavity was loose and came off readily by traction with the finger nail.

Taking into consideration the deplorable results that ensue from compound comminuted fractures of and above the trochanter, and the great length of time they take in treatment, the necrosed bone left for years, if they ever do recover, would it not be safe surgery in these cases to excise the head of the bones? Instructed by the disastrous results of these cases in our hands, and encouraged by the cases of O'Leary and Jarret, we have been thinking seriously, that in fractures of this sort, resection is perfectly justifiable, and even demanded. We can at this time call to mind one case that was brought to General Hospital No. 1, in this city, from some other hospital, in which the patient had been bed ridden for many months, over a year certainly, and in which the end of the femur
was drawn upon the outer and posterior portion of the ilium near to its crest. The condition of this man was deplorable to behold; the end of the bone was necrosed, and with the most fortunate result that could happen to him, the limb was useless. The articulation to be opened is not a large one, although it is deeply seated; it compares only with the shoulder. The results of resection are so encouraging, and we can see no reason why, taking into our estimate the greater danger in the lower extremity of all capital operations, it should not in many cases succeed. The danger in these hip joint wounds is not primary, but is the result of exhausting suppuration, and pyæmic poisoning. These accidents are in a great measure avoided by resection of the head of the femur. Traumatic arthritis and its dangers are, by this ablation, put entirely out of the way, and the purulent secretions, instead of burrowing under and between the tissue, have outlet through the incision made, and the chance of saving life is increased. By the expectant plan there is certain death; by resection, a possibility of recovery with a useful limb.

Various flaps and incisions have been advised and practiced in this operation. The simple vertical incision answers all purposes. The patient should be placed on a table of convenient height, lying on his sound side, his face turned to the edge of the table, or outward. The surgeon standing at the opposite side of the table at the patient's back, makes with a strong scalpel, an incision over the edge of the trochanter major down to the articulation. The length of this incision varies with the amount of the femur to be excised with the head of the bone; it should be at least five inches in length, extending two or three inches below the trochanter, the joint should be reached by this incision, the capsule must then be opened; an assistant standing in front of the patient
now places the joint on the stretch and dislocates it backwards, by seizing the extended leg, rotating it strongly inwards, and then pushing it from him under the edge of the table. This places the joint fully on the stretch; the surgeon now divides the ligamentum-teres. If it be possible to divide this, the muscular attachments to the trochanter and its fossa must be cut, and all difficulty will be overcome. The bone must now be divided with the saw, and all loose spiculae, many of which may be found drawn into the surrounding tissues, should be carefully picked out; little bleeding occurs, and no ligatures are usually required. The ends of the incision may now be closed, but a large vent must be left for the escape of the secretions. If the acetabulum be found injured, the loose portions must be taken off with the forceps. In case of the head of the bone being separated from the shaft, great difficulty will be experienced in separating the round ligament. The head of the bone must be seized by the "lion forceps" and dislocated by means of them.

Many lay great stress on fixing the parts immoveably. This does not seem of great importance; all that is requisite is to apply a bracketed splint so as to prevent the end of the femur from pushing against the wound, and this must be so applied as not to interfere with the contraction of the muscles, which tend to shorten the limb, by drawing the end of the bone up to the acetabulum. The wound should be often washed out with warm water, or some preparation as suggested before, that has a tendency to restrain the excessive suppuration. Bagging of pus must be prevented by the suitable adjustment of pads and pillows. The double inclined plane has been advised, but seems objectionable, for it prevents the needed contraction of the thigh muscles.
In the Crimean war, one case only of resection of this articulation is mentioned by Macleod. The patient for some time did well, but succumbed to an attack of intestinal derangement, induced by eating apples. We find in the tables given of wounds of joints, recovery without surgical interference, ninety-nine cases of knee joint wounds there set down, with forty-five recoveries and fifty-four deaths. These statistics show also twenty-four cases of knee joint wounds, said to be doing badly. These it will be fair to put down as dead by this time, as no subsequent note has been made of them. Macleod states that in the year 1854 he saw forty cases in the French hospital, all of which resulted in death, save when primarily amputated. In the Indian reports, he states, in a "note," that he has been able to find the particulars of nine cases in which the knee was penetrated, but the injury was apparently so slight as to lead the attendants to try and save the limb; every one died. Alcock has stated, as before mentioned, that the proportion of cases in which the articulations are wounded, to other gunshot wounds, are between four and five per cent., nearly half of which were in the knee; of thirty-five cases, in which the knee was more or less implicated, twenty-two lost their lives and eight their legs. After such results he says: "It is little to say that the five who recovered preserved good and useful limbs." These results are very different from those shown in our table, and correspond so little with the experience of all the surgeons with whom we have had occasion to speak on this subject, that we are forced to conclude that either the successful cases being wonderful are reported, and
the dead not numbered, or that they were peri-articular, the joint itself not being implicated.

In civil practice, the resection of this joint for disease, has been attended with the most favorable results, as to life and the subsequent utility of the limb. The mortality is less, according to Mr. Ferguson, than after amputation in the thigh for disease of the knee joint. We have lately had the pleasure of meeting a surgeon from London, and in discussing the subject, he stated that a few days before he left that city, at a clinique of Mr. Ferguson's, he had seen three cases, in which resection of the knee had been performed some time before, and that the gastroc-nemii muscles were developed in proportion to the time that had elapsed from the operation in each case. The great mortality in field practice can satisfactorily be accounted for by the surroundings of the soldier, and the want of necessary appliances for the treatment. The nice adaptation of the divided ends of the bone; the perfect fixedness of the parts; so as to prevent the least motion; the assiduous attention to nourishment, and correct diatetic regulations; and the perfect repose of a separate apartment, cannot be obtained in the field, where, after the operation, the patient may have to be moved many miles over a rough road, in jolting ambulances and crowded cars. Mr. Ferguson justly sums up the advantage of this operation in civil practice. The wound is less than an amputation of the thigh; the bleeding seldom requires more than one or two ligatures; the loss of substance is less, and probably on that account there is less shock to the system; the chances of secondary hemorrhage are scarcely worthy of notice, as the main artery is left untouched; there is, in short, nothing in the after consequences more likely to endanger the patient's safety than after amputations, while the prospect of retaining a useful and substantial limb, should encourage
both patient and surgeon to this practice. Were all the conveniences for treatment in the field as in private practice, the reasons would be equally forcible. The patient not being a sickly, puny, scrofulous child, but in the full vigor of manhood, would have more strength to resist the shock, and more recuperative energy for the building of the connective tissue.

It certainly appears right that conservative surgery should be attempted in some of these cases; for the ruthless amputation for all gunshot injuries to the knee joint, is an opprobrium to military surgery. When the accident happens in the neighborhood of good hospital accommodations, and the injury is confined to the articular ends of the bones, and does not extend beyond the epiphysis of the bones, it seems worthy of trial, as the limb that results is superior to any artificial appliance. Moreover, we have seen that where the articulation is opened, and slight injury only has been inflicted on the ends of the bones, or rather the articular cartilages, primary incisions have been attended with good results, and that in all these cases, as far as we know, ankylosis results from the destruction of the cartilages of the joints, and that the union between the ends of the bones is fibrous, or better still, osseous. It is certainly rational to think that this danger would not be aggravated by sawing through the epiphysis of the bones and bringing their raw facets in immediate contact, so that the granulations that rapidly spring up from healthy bone when cut, could speedily cover the ends and unite the opposing granulations. In disease, and when the joints are opened, before this union can take place, destructive ulceration of the cartilages must occur.

The following case is taken from Macleod, illustrating the post mortem examination of the knee joint after resection for gunshot wound: "Death twenty-seven days
after resection; post mortem fourteen hours after death. Before removing the body to the dead tent, the orderlies had taken off the splint, and the limb had been allowed to hang down, so as to destroy any points of union there might have been. The wound had healed, except its extremities, the granulations of which had shrunk and assumed a black appearance (post mortem). The opposite surface of the bone presented a very similar appearance, and there was no sign of dead bone. They had become moulded to one another in shape. Whether there had been any union towards the centre was not evident; at the circumference there were appearances of adhesion having been broken. The cavity of the joint contained only a small quantity of pus. The abscess in the outer part of the thigh had almost healed, the viscera healthy."

One case of resection of the knee has resulted well in General Hospital, No. 4, in the case of Capt. Knowlton, wounded in the battle of Payne's farm. This case has been reported in full to the proper authorities, and we will only mention here some of the leading points that bear on this subject. The leg was strongly flexed upon the ham, where impinged upon by the ball (a minnie), which after touching the articular cartilage and opening the synovial sack, turned up, and was removed on the field, by an incision near the upper edge of the patella; it had formed a groove in the outer condyle of the femur, and barely touched the cartilage. There was no discharge of the synovia, and up to the tenth day after admission; the twelfth after the injury no serious symptoms ensued; on the tenth the joint became painful and swollen, he had two slight rigors, and some slight febrile excitement on the eleventh day. These symptoms being on the increase, and traumatic arthritis being imminent, with the advice of Surgeons Gibson and Michel, it was decided to excise
the joint. The secretions of the capsule were found thin, turbid, filled with fibrous flocculi. The synovial sack was slightly reddened, the cartilages and bone were healthy; about two and a half inches were sawed off, in the endeavor to cut away the groove made by the ball, the patella was dissected away. The section of the bone was made obliquely downward and backward for the femur, and the reverse for the tibia, so that when brought into apposition the leg would be slightly bent, and the toe inclined forward and downwards. The ends of the bone were snugly fastened together with silver sutures, no vessels were ligated, and before the patient was moved from the table the leg was placed in a long fracture box, extending from the nates to below the foot. This box had moveable sides. The leg was well padded under the knee so as to prevent the bones breaking out the wire sutures by their weight, being unsupported in the popliteal space. After some days this box was removed and the leg merely adapted to bracketed splints. This patient's general health and temper rendered him peculiarly unsuited for such an operation. He was naturally irritable and discontented, and subject to hepatic derangement. In four months the internal wound was closed, one of the wire sutures remaining in the limb, but seemed to give no trouble. The union between the ends of the bone is firm, but permits of slight motion, when the limb is taken between the thigh and leg. It can support itself to be lifted up from the heel. The patient left the hospital with the leg strengthened by a leather splint.

As resection of this joint under favorable circumstances has so seldom been performed in this war, your committee will not hazard at this time an opinion as to the comparative results of resection and amputation for injuries that penetrate its cavity, without inflicting much damage on the articular ends of the bones, we, however, in view
of the great advantage of the limb retained, even if stiff and slightly shortened, over the artificial limb that must be used in its place, are much inclined to resection when the condition of the patient or his age will warrant, in the surgeons opinion, such proceeding, and suitable appliances are at hand. In many cases, as in Capt. Knowlton’s, the synovitis does not set in for days, and there is generally plenty of time to send the wounded man to some neighboring hospital for treatment or operation, fixing the joint for this purpose firmly in the bracketed splint, that will shortly be described. It would be safe and judicious practice in the field to examine all wounds of the knee joint, or in its vicinity, enlarging the opening freely for this purpose, so as to ascertain clearly the exact condition of the articulation. If this be found to be much implicated, with destruction of epiphysis of the bone or the splitting of the shaft in the joint, no harm is done, and the case can be completed by amputation. If there be found but slight injury to the articulation, so that a section of the shortened ends will not take off more than two and a half inches from the length of the limb, or open the medullary cavities, and if the vessels and nerves be uninjured, then resection may be attempted with prospect of success. If on the other hand it be found that only the sack be opened and cartilage uninjured, the free incision will expedite the treatment of the case.

The horse shoé incision is the one generally used in this resection, extending from one condyle to the other over the front of the joint under the patella. The tendon of the extensor muscle is now divided, and the flap containing the patella turned up. The joint is then opened by flexing the leg strongly on the thigh, the ligaments are divided and the bones cleansed of the soft parts as far as necessary, care being taken not to injure the vessels running along the back of the joint through
the popliteal space. The soft parts should now be protected by a wooden spatula or a piece of leather drawn over them, and held out of the way by an assistant. The end of the femur must now be divided with the saw, taking care to make the section in such direction as to insure the after adjustment in the way that will best conduce to the production of a useful limb; the tibia is now to be divided by the saw, in these sections we must be careful to conform ourselves to the epiphysis of the bones.

The removal of the patella is still a mooted point, some Surgeons taking it away and others allowing it to remain. In Knowlton's case it was removed. If it be not ablated it must be twisted over, and its articular cartilage shaved off with the scalpel, and we must attempt to procure union between it and the anterior aspect of the ends of the femur and tibia. In civil practice we find an average gain, in the treatment of cases in which the patella is cut away, of thirty days. In Dr. Hodge's tables, the duration in the treatment of forty-eight cases in which the patella was removed is stated to have been 225 days; where it was not removed 255. The average duration of treatment in these cases was eight months. In Knowlton's case the time was four months, or just one-half of the time required for the treatment of cases in civil practice.

If the ends of the femur and tibia after this first section are not perfectly adjustable, then sections must be made until this is secured. These two bones should be then firmly tied together with sutures of strong silver or annealed iron wire; the ends of the wire should be left long, and be carried out of the side incisions, rather at the bottom of the wound, as the part that will heal last. The little instrument devised and employed by Surgeon Bolton for ununited fractures, would answer admirably for this purpose, by being placed on each side of the joint,
and then by the use of the screw, the ends of the bones could be pressed firmly and perfectly together. The incision through the skin should be closed by sutures, taking care to leave room enough for that discharge to pass through at the lower edge of the wound.

The limb from the foot to the knee should now be covered with a double layer of cotton wadding, or sheet tow, over which an uninterrupted bandage should be applied. The same should be applied to the thigh from the groin to the knee. As these dressings are to remain untouched for a long time, they should be guarded from soiling near the wound by oiled silk. A well padded posterior splint, extending from the middle third of the thigh down to the tendon of posterior muscles of the leg, cut out so as to be narrow under the knee, and padded so as to fill up the popliteal hollow, protected here likewise with oiled silk, should now be firmly fixed to the leg. A Smith's wire splint, bent up to an angle at the foot, may be bound tightly to the splint, and will answer all purposes of a foot board, and will keep the foot from twisting the knee by any lateral motion. By means of this posterior splint, bent so as exactly to fit, we can keep pressure on the leg, and so hold the edges of the bone in contact. Two long splints, interrupted at the incision opposite the joint, are now to be placed on either side of the limb, extending from the upper side of the thigh to the sole of the foot. These must be nicely padded, and may be held in position by strips of bandage tied at different points, so many as may be needed. The limb may be suspended from a Salter's apparatus, or by some extemporaneous contrivance.

Dr. Howell Thomas, of this city, on duty for some time at General Hospital, No. 1, under charge of Surgeon Gibson, has ingeniously adapted Smith's anterior splint to the purpose of bracketing the long straight splint, by
bending them into suitable shape and bandaging them firmly to the splint, which are then cut out corresponding to the elbow made by the wire. The ends of the wire splint, if too long, may be bent laterally on the sole of the foot, then placing this in a firm wire box. This arrangement preserves perfect immobility of the limb, and permits the dressing to be applied and changed as often as may be requisite. They are readily extemporized and might be of use in wounds of joints in the field; if suspended from the roof of the ambulance, or car, the patient could travel without much jar or jolting.

A Mr. Jones is mentioned in Erichson, who was in the habit of excising the knee without dividing the ligamentum patella, but he began his operation by making the ordinary horse-shoe cut in the skin.

The Chairman of this Committee, appreciating the importance of preserving the tendinous attachment of the anterior muscles of the thigh, so that it might act antagonistically to the ham-string muscles, has twice of late, on a dead subject, performed resection of the knee on this wise: From the lower edge of the patella, whilst the leg is extended, an incision is made through the skin into the joint and carried down to the ham-string tendons; this is done on both sides—at its middle this is crossed by a vertical incision, two inches in length; these flaps are dissected back. The knee is strongly flexed, and the lateral and crucial ligaments are divided, cutting from below upwards. The soft parts are carefully and slowly cleared away from the back of the femur with the finger and handle of the scalpel and perhaps a few touches of the knife, keeping the edge near the bone. This part of the operation must be carefully proceeded with and the pulsations of the artery should be sought for so as to keep the edge of the knife away from it. A piece of soft leather being now passed under the condyle of the femur, the
soft parts are strongly depressed by an assistant; another assistant, by means of a strong piece of bandage, holds up the patella and its ligaments. The blade of Mr. Butcher's saw is now passed in, the handle attached, and the bone divided, cutting from below upwards. This is repeated for the head of the tibia, and the patella being everted and its cartilage being sheared off, the operation is complete.

Resections of the ankle joint for gunshot wounds penetrating the articulation, are rarely performed. Most Surgeons, owing to the complex arrangement of the synovial membrane of this joint with the tarsal articulations, and the bad results that have often ensued from the wounds, have inclined to have recourse to amputation. Macleod states, however, that penetrating wounds of the ankle did well, although they demanded long treatment. This, he says, is opposed to usual experience in such injuries; and he further remarks that where the openings were largest the patient did best.

We find in our table of incisions of joints, five cases with one death, which support this statement.

If resection be determined on, a straight incision on either side of the joint will enable us to throw out the ends of the tibia and of the fibula, and saw them off. Generally speaking, however, the simple enlargement of the wound, and careful extraction of loose pieces, will fill all indications. The foot, during treatment, should be permanently fixed, as ankylosis must result. On two occasions during this war after months of assiduous care, we have been compelled to amputate at the lower third of the leg.
ARTICLE VII.

Relations of Pneumonia and Malarial Fever: with Practical Observations upon the Antiperiodic or Abortive Method of Treating Pneumonia. By Joseph Jones, M. D., Professor of Chemistry in the Medical College of Georgia.

The great mortality caused by typhoid fever and pneumonia in the hospitals and armies of the Confederate States, invested these diseases with peculiar interest and importance.

After a careful examination of the official reports, on file in the Surgeon-General’s office at Richmond, Va., we established the important fact, that up to the time of this examination and consolidation of the sick reports, and mortuary records (September, 1863), pneumonia and typhoid fever had caused one-half of all the deaths from all causes, gunshot wounds included, in the field and general hospitals. We were led to draw up extended reports, presenting the results of our investigations upon the causes, nature and treatment of the most fatal diseases. The manuscript volumes thus prepared for the use of the Medical Department of the Confederate States were captured or burnt at the time of the evacuation of Richmond.

In the report upon pneumonia, we urged that each medical officer of the Confederate army, should as far as possible, test the value of the different modes of treatment before the profession. Whilst there existed no want of theories, of positive assertions, and of unbounded confidence in special remedies in the treatment of pneumonia; unfortunately, however, the experience of which
we heard so much, availed but little in the accurate determination of practical questions, involving as was carefully and fully demonstrated, the lives of a great proportion of those afflicted, and in truth, of thousands of the brave defenders of their country. It is customary to dignify with the title *extensive experience*, the use of one or more remedies for a series of years amongst a number of patients, regardless of the intelligence which selected those remedies, regardless of the fact whether those remedies were selected as the result of education, or of accident or prejudice, or as the result of careful and conscientious investigation and comparison of the relative effects and value of different modes of treatment. It was urged, that under all circumstances of peace or of war, and especially in a contest in which the entire community was emptied of its male population, from boyhood to old age, and from the statesman to the day-laborer, such investigations should be considered of the greatest moment, and should be conducted with the most scrupulous accuracy and honesty; and the belief was expressed that with concert of action, amongst conscientious and competent observers, results of great value would be achieved.

In medical science, as well as in sciences of more exact observation, no other method except that of strict induction from well observed facts will result in the establishment of fixed and general principles, which will express with truth the operations of nature, and enable man to guide and direct them in fixed modes for the accomplishment of useful ends. Hypothetical discussions of disease, and of the action of medicines, apart from established facts, are worse than useless—they are positively injurious, by calling off the mind from rigid experiment and from the careful observation of nature.

In Therapeutics we need above all things, rigid obser-
vations upon the effects of the different agents on the
duration, progress, effects and termination of particular
diseases.

In every inquiry in Therapeutics, the physician should
endeavor to determine—

1st. The natural progress of the disease when no reme-
dies have been used: What is the natural history of the
disease: What are the tendencies of the disease—to
recovery, or to death. The relative mortality to the
total number of cases and to other diseases: When
recovery takes place what is the process; and when death
takes place, what are the antecedents, and the immediate
causes. The effects of variations of climate, of previous
habits, of diet and of age, as well as the extent and
severity of the inflammation or disease should be accu-
rately noted; also the effects of various modes of diet
and stimulation.

The results of such investigations will form a standard
by which the value of different remedies may be deter-
mined. Every conscientious physician desires to dispense
with all needless medicines; and if it were possible to
treat certain diseases by aliment alone, with more success
than with drugs, it would be the duty of the physician to
conform the treatment to the established course of nature.

2d. Whether the remedies used diminish the rate of
mortality in particular diseases, and thus contribute to
the safety of the patients.

3d. Whether the remedies abridge the course of the
disease.

4th. Whether they lessen the sufferings.

5th. Whether they leave any injurious results.

6th. The modes in which the remedies assisted nature
in the relief of the disease.
With a number of physicians, thus acting in concert, even if each one experiments with and records his experience with only a single remedy, and that his accustomed and favorite one, it will be possible, in the course of time, to determine with an approach to accuracy, the most efficacious remedies and modes of treatment.

In the report referred to, the various modes of treating pneumonia were classed under the following heads:

1st. Dietetic System.

2d. Rational Treatment designed to further the natural progress of Pneumonia towards recovery.

3d. Antiperiodic, or Abortive Treatment of Pneumonia.

4th. Antiphlogistic System of Treatment.

The following table was drawn up from the official field and hospital reports, with the design of comparing the results of the treatment of pneumonia by Confederate Surgeons, with the mortality under different systems of treatment:
TABLE Illustrating the Rate of Mortality in Pneumonia under Different Modes of Treatment. Prepared from the Hospital and Field Reports of the Confederate Army of America, and also from the published statistics of various European Hospitals and Armies. By Joseph Jones, Surgeon in the Provisional Army of the Confederate States.

<table>
<thead>
<tr>
<th>NAME OF HOSPITALS AND PHYSICIANS</th>
<th>LENGTH OF TIME</th>
<th>SYSTEM OF TREATMENT</th>
<th>No. of Cases of Pneumonia</th>
<th>No. of Deaths from Pneumonia</th>
<th>Per cent. of Deaths in Cases of Pneumonia</th>
<th>One Death in — Cases of Pneumonia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confederate forces serving in S. C., Ga. &amp; Fla.; mean strength 25,670; field reports</td>
<td>19 months—Jan, 1862—July, 1863</td>
<td></td>
<td>2,190</td>
<td>127</td>
<td>5.99</td>
<td>16.7</td>
</tr>
<tr>
<td>Confederate forces serving in S. C., Ga. &amp; Fla.; hospital reports</td>
<td>19 months—Jan, 1862—July, 1863</td>
<td></td>
<td>1,862</td>
<td>370</td>
<td>19.3</td>
<td>5.03</td>
</tr>
<tr>
<td>Confederate forces serving on Gulf of Mexico; mean strength 6,732; field reports</td>
<td>19 months—Jan, 1862—July, 1863</td>
<td></td>
<td>1,163</td>
<td>151</td>
<td>12.9</td>
<td>7.7</td>
</tr>
<tr>
<td>Confederate Army of the West and Tennessee; mean strength 40,973; field reports</td>
<td>12 months—June, 1862—May, 1863</td>
<td></td>
<td>6,974</td>
<td>1,090</td>
<td>15.6</td>
<td>6.4</td>
</tr>
<tr>
<td>Confederate Army of the West and Tennessee; hospital reports</td>
<td>12 months</td>
<td></td>
<td>2,967</td>
<td>543</td>
<td>18.3</td>
<td>5.4</td>
</tr>
<tr>
<td>Empire Hospital, Atlanta, Ga</td>
<td>28 months—March, 1862—Oct, 1864</td>
<td></td>
<td>2,671</td>
<td>73</td>
<td>27.3</td>
<td>3.6</td>
</tr>
<tr>
<td>Medical College Hospital, Atlanta, Ga</td>
<td>29 months—Feb, 1862—June, 1864</td>
<td></td>
<td>3,481</td>
<td>129</td>
<td>35.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Gate City Hospital, Atlanta, Ga</td>
<td>16 months—March, 1862—Nov, 1863</td>
<td></td>
<td>3,811</td>
<td>51</td>
<td>13.3</td>
<td>7.4</td>
</tr>
<tr>
<td>Institute Hospital, Atlanta, Ga</td>
<td>13 months—Sept, 1863—Sept, 1864</td>
<td></td>
<td>198</td>
<td>45</td>
<td>22.7</td>
<td>4.4</td>
</tr>
<tr>
<td>Fair Ground Hospital No. 1, Atlanta, Ga</td>
<td>24 months—Oct, 1862—Sept, 1864</td>
<td></td>
<td>323</td>
<td>114</td>
<td>35.4</td>
<td>9.8</td>
</tr>
<tr>
<td>Fair Ground Hospital No. 2, Atlanta, Ga</td>
<td>20 months—Feb, 1863—Sept, 1864</td>
<td></td>
<td>323</td>
<td>96</td>
<td>29.6</td>
<td>3.37</td>
</tr>
<tr>
<td>Polk Hospital, Rome, Atlanta &amp; Vineville, Ga.</td>
<td>12 months—Oct, 1863—Sept, 1864</td>
<td></td>
<td>54</td>
<td>11</td>
<td>20.3</td>
<td>4.9</td>
</tr>
<tr>
<td>Roy Hospital, Atlanta, Ga</td>
<td>10 months—Jan, 1863—Jan, 1864</td>
<td></td>
<td>50</td>
<td>11</td>
<td>22.0</td>
<td>4.5</td>
</tr>
<tr>
<td>Ocmulgee Hospital, Macon, Ga</td>
<td>9 months—Feb, 1864—Oct, 1864</td>
<td></td>
<td>50</td>
<td>6</td>
<td>12.0</td>
<td>3.33</td>
</tr>
<tr>
<td>Stout Hospital, Macon, Ga</td>
<td>4 months—June, 1864—Sept, 1864</td>
<td></td>
<td>10</td>
<td>3</td>
<td>30.0</td>
<td>3.33</td>
</tr>
<tr>
<td>Blind School Hospital, Macon, Ga</td>
<td>9 months—Jan, 1864—Sept, 1864</td>
<td></td>
<td>37</td>
<td>6</td>
<td>16.2</td>
<td>6.1</td>
</tr>
<tr>
<td>Floyd House Hospital, Macon, Ga</td>
<td>30 months—April, 1863—Sept, 1864</td>
<td></td>
<td>295</td>
<td>47</td>
<td>15.2</td>
<td>4.3</td>
</tr>
<tr>
<td>Establishment</td>
<td>Duration</td>
<td>Cause of Death</td>
<td>Mortality Rate</td>
<td>Mortality Rate 1/1000</td>
<td>Years of Life Lost</td>
<td></td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>------------------------</td>
<td>-------------------------</td>
<td>----------------</td>
<td>------------------------</td>
<td>-------------------</td>
<td></td>
</tr>
<tr>
<td>Marine Hospital, Charleston, S. C.</td>
<td>13 months--Jan, 1862-Feb, 1863</td>
<td>Dietetic system</td>
<td>25</td>
<td>9</td>
<td>36.0</td>
<td></td>
</tr>
<tr>
<td>Citadel Square Hospital, Charleston, S. C.</td>
<td>10 months--Jan, 1862-March, 1863</td>
<td>Rational treatment</td>
<td>67</td>
<td>8</td>
<td>11.9</td>
<td></td>
</tr>
<tr>
<td>Trapman Street Hospital, Charleston, S. C.</td>
<td>16 months--Dec, 1861-March, 1863</td>
<td>Antiphlogistic treatment</td>
<td>73</td>
<td>3</td>
<td>3.87</td>
<td></td>
</tr>
<tr>
<td>General Hospital No. 1, Savannah, Ga.</td>
<td>June, 1862-Jan, 1864</td>
<td>Antiphlogistic bleeding and Tar. Emet.</td>
<td>50</td>
<td>4</td>
<td>8.60</td>
<td></td>
</tr>
<tr>
<td>General Hospital No. 2, Savannah, Ga.</td>
<td>May, 1862-Jan, 1864</td>
<td>Antiphlogistic bleeding and Tar. Emet.</td>
<td>50</td>
<td>4</td>
<td>8.60</td>
<td></td>
</tr>
<tr>
<td>Guyton Hospital, near Savannah, Ga.</td>
<td>44 months--July, 1861-Feb, 1865</td>
<td>Antiphlogistic bleeding and Tar. Emet.</td>
<td>647</td>
<td>207</td>
<td>31.9</td>
<td></td>
</tr>
<tr>
<td>General Hospital, Staunton, Va.</td>
<td>15 months--Sep, 1863-Feb, 1864</td>
<td>Antiphlogistic bleeding and Tar. Emet.</td>
<td>187</td>
<td>37</td>
<td>19.7</td>
<td></td>
</tr>
<tr>
<td>General Hospitals in Va., out of Richmond</td>
<td>13 months--Jan, 1862-April, 1863</td>
<td>Antiphlogistic bleeding and Tar. Emet.</td>
<td>4,774</td>
<td>1,261</td>
<td>26.41</td>
<td></td>
</tr>
<tr>
<td>Charity Hospital, Vienna, Dr. Died</td>
<td>1843-3 years 5 months</td>
<td>Antiphlogistic bleeding, calomel, etc.</td>
<td>189</td>
<td>14</td>
<td>7.46</td>
<td></td>
</tr>
<tr>
<td>Charity Hospital, Vienna, Dr. Skoda</td>
<td>1843-3 years 5 months</td>
<td>Antiphlogistic bleeding, calomel, etc.</td>
<td>392</td>
<td>54</td>
<td>13.17</td>
<td></td>
</tr>
<tr>
<td>Edinburg Royal Infirmary, Dr. Bennett</td>
<td>8 years</td>
<td>Antiphlogistic bleeding, calomel, etc.</td>
<td>38</td>
<td>6</td>
<td>8.63</td>
<td></td>
</tr>
<tr>
<td>Kings College Hospital, Dr. Todd</td>
<td>1847-1859</td>
<td>Bleeding, Antiphlogistic treatment</td>
<td>73</td>
<td>12</td>
<td>3.84</td>
<td></td>
</tr>
<tr>
<td>Hospital la Charité, Louis</td>
<td>1847-1859</td>
<td>Antiphlogistic bleeding and Tar. Emet.</td>
<td>78</td>
<td>28</td>
<td>35.85</td>
<td></td>
</tr>
<tr>
<td>Hospital la Petite, Louis</td>
<td>1847-1859</td>
<td>Antiphlogistic bleeding and Tar. Emet.</td>
<td>28</td>
<td>4</td>
<td>31.57</td>
<td></td>
</tr>
<tr>
<td>Massachusetts General Hospital, Dr. Jackson</td>
<td>1851-1855</td>
<td>Antiphlogistic bleeding and Tar. Emet.</td>
<td>167</td>
<td>23</td>
<td>29.94</td>
<td></td>
</tr>
<tr>
<td>Royal Infirmary of Edinburg, Dr. Bennett and others</td>
<td>1851-1855</td>
<td>Antiphlogistic bleeding and Tar. Emet.</td>
<td>51</td>
<td>8</td>
<td>15.68</td>
<td></td>
</tr>
<tr>
<td>Royal Infirmary of Edinburg, Dr. Bennett and others</td>
<td>1851-1855</td>
<td>Antiphlogistic bleeding, calomel, etc.</td>
<td>50</td>
<td>19</td>
<td>38.1</td>
<td></td>
</tr>
<tr>
<td>Kings College Hospital, Dr. Todd</td>
<td>1851-1855</td>
<td>Antiphlogistic bleeding, calomel, etc.</td>
<td>648</td>
<td>222</td>
<td>34.26</td>
<td></td>
</tr>
<tr>
<td>Hospitals of Milan, Kasori</td>
<td>1851-1855</td>
<td>Antiphlogistic bleeding, calomel, etc.</td>
<td>25</td>
<td>4</td>
<td>16.8</td>
<td></td>
</tr>
<tr>
<td>Hospitals of Bologna, Tommasini</td>
<td>1852-1855</td>
<td>Antiphlogistic, Tartar Emetic</td>
<td>823</td>
<td>173</td>
<td>20.79</td>
<td></td>
</tr>
<tr>
<td>Clinic of Faculty of Medicine, R. Laennec</td>
<td>1853-1855</td>
<td>Antiphlogistic, Tartar Emetic</td>
<td>115</td>
<td>14</td>
<td>12.17</td>
<td></td>
</tr>
<tr>
<td>Dr. Hells, of Rouen</td>
<td>1853-1854</td>
<td>Antiphlogistic, Tartar Emetic</td>
<td>63</td>
<td>6</td>
<td>9.97</td>
<td></td>
</tr>
<tr>
<td>Hotel Dieu, of Nantes, Dr. A. Laennec</td>
<td>1853-1854</td>
<td>Antiphlogistic, Tartar Emetic</td>
<td>54</td>
<td>5</td>
<td>10.8</td>
<td></td>
</tr>
<tr>
<td>Charity Hospital, Dr. Dietl</td>
<td>1854-5-6</td>
<td>Antiphlogistic, Tartar Emetic</td>
<td>40</td>
<td>6</td>
<td>15.4</td>
<td></td>
</tr>
<tr>
<td>Charity Hospital, Dr. Dietl</td>
<td>1854-5-6</td>
<td>Antiphlogistic, Tar. Emet. large doses</td>
<td>106</td>
<td>22</td>
<td>20.7</td>
<td></td>
</tr>
<tr>
<td>English Army in Crimea</td>
<td>1854-5-6</td>
<td>Antiphlogistic bleeding</td>
<td>85</td>
<td>17</td>
<td>20.09</td>
<td></td>
</tr>
<tr>
<td>United States Army, Civil War of 1861-2</td>
<td>1861-July, 1862</td>
<td>Antiphlogistic bleeding</td>
<td>590</td>
<td>181</td>
<td>27.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Antiphlogistic bleeding, calomel, etc.</td>
<td>11,061</td>
<td>2,334</td>
<td>19.2</td>
<td></td>
</tr>
</tbody>
</table>
The important fact illustrated by this table, is that the mortality from pneumonia, in a large number of Confederate hospitals (those entered upon the table were selected without any reference to the character of the statistics), was far greater than the mortality in this disease under different modes of treatment in European hospitals.

The mortality in these Confederate hospitals has been twice as great as that under tartar emetic in large doses, and about four times as great as under the dietetic system, in which the powers of nature are simply supported, and drugs abandoned. These facts are surely sufficient to excite an earnest and diligent inquiry into the relative merits of the different modes of treating pneumonia, now in use by Southern physicians.

In the present paper we propose to consider the

*Antiperiodic or Abortive Treatment of Pneumonia.*—These terms are used, not so much to indicate the true nature of this plan of treatment, as to express the views which have led to its employment by various practitioners in the Southern States.

Southern physicians, have for a number of years, used quinine in the treatment of pneumonia; and previous to the recent civil war, a number of articles have from time to time appeared in the various medical journals, extolling the virtues of quinine in the treatment of this disease, and more especially in malarious regions. By many of the advocates of the power of quinine to greatly modify and even arrest the progress of pneumonia, the doctrine is held that the disease arises from the same causes, is intimately associated with malarial fever, and in fact is nothing more than one of the forms of periodic fever. The remark is not unfrequently heard, that pneumonia should be treated as a malignant remittent. Those who adopt the view of the identity of paroxysmal fever and pneumonia, believe that quinine in full doses, is capable
of arresting the latter, in the same manner that it arrests or aborts the former.

We might bring forth numerous quotations from the older writers, to prove that the belief in the identity of the causes and ultimate nature of pneumonia and paroxysmal fever, as well as the treatment by bark and quinine founded upon this view, are by no means so novel as some of the modern writers, and especially American medical writers, would have us believe. Our limited space, however, will permit only brief references to some of the most trustworthy authorities.

Jean Senac* in his celebrated and unsurpassed treatise on the "Hidden Nature and Treatment of Intermittent and Remitting Fevers," discourses in several chapters upon the conversion of intermittent fever into pleurisy and pneumonia; and in his observations upon the method of detecting or distinguishing intermittent fevers, when disguised under the mask of other diseases, relates a case of intermittent pleurisy, cured by febrifuge remedies. Galenius, near seventy years ago, in a work on Peruvian bark, pointed out the efficacy of this remedy in the cure of pneumonia occurring in intermittent fever, and which he considered as one of the manifestations of paroxysmal fever. George Cleghorn, in his "Observations on the Epidemical Diseases of Minorca, from the year 1744 to 1749," describes a fatal form of pneumonia and pleurisy, with distinct remissions. "When those pleurisies," says Cleghorn, "first became epidemical, their quick progress and uncommon mortality surprised me greatly. I attempted to cure them by bleeding; once or twice a day, if the complaints were violent, as I had always used to do in inflammatory fevers; but the remissions in the mornings sometimes induced me to omit the operation; and

*De Recondita Fabrium Intermittentium, tum Remittentium Natura et de earum Curatione: Variis experimentis et observationibus illustrata. 1769.
the cessation of the symptoms, which generally happened about the third day, made me imagine that the danger was over; so that before the patients were blooded above two or three times, the exacerbation came on upon the fourth or fifth day, and defeated all attempts by bleeding, blistering, or otherwise to relieve them.

"Those unforeseen events startled me greatly, and led me to review the whole progress of the disease, its symptoms and issue. I had observed that some escaped by means of expectoration and purulent urine, without much assistance from phlebotomy; and considering the periodical revolutions of the fever, the quick transition of the stitches from one part to another, together with the prevailing color of the blood, as well as that of the spitting, and other excretions, I was apprehensive that those were what authors call bilious pleurisies, which they allege are exasperated by large evacuations:* particularly Duretus,† who exclaims with great vehemence against those physicians who trust principally to bleeding in the care of those diseases, without waiting for the natural evacuations."

Loc cit. p. 164-5.

Morton appears to have frequently detected the malignant intermittent concealed under the mask of pneumonia and pleurisy. This physician relates, among others, the case of a man who was seized in the morning with a violent shivering, and a pain in the thorax of so severe a character as to render respiration scarcely practicable. The pulse of the patient was small and rapid, his weakness was extreme, and universal coldness overspread all the limbs. Notwithstanding these symptoms, blood-letting from the arm was employed as the necessary and proper remedy for this spasmodic state of the respiration.

†O homines republicae calamitosos atque funestos! ipsam pleuritidem, quae sua sponte nullius operis indigens cum tali sputo quiesceret, ex eventur reddunt mortiferam. Duret in Praenot. Conc.
When, however, from the nature and return of the paroxysms, Morton detected a fever of a malignant character, masked under the appearance of a peripneumony, he made the bark the principal foundation of his treatment, and succeeded in arresting the disease.

Lautter, as quoted by Alibert, in his treatise on malignant intermittents, has recorded two similar cases in his Hist. Medic. bienn. morb. rural, etc.; Casus v. & ix.

A labourer of Luxembourg, thirty years of age, of a dry temperament, being engaged in threshing corn, was seized, first with a trembling, and then with a violent coldness, to which succeeded a short hot fit, and great thirst. The principal symptom was an excessive pain in the left side, which considerably impeded respiration. Being obliged to quit his work, he took to his bed; the fever continued nearly eighteen hours in the same state, and then underwent a perceptible remission. On the morning of the day following, the patient was still better. Although he was rather feeble, the stitch in his side continued, and he was certainly in some degree feverish, yet he went to work again, but all the symptoms returning toward evening, he again took to his bed. Lautter was called in; he found his patient laboring under a high fever, his pulse was hard, his respiration laborious, painful, and almost suppressed; the pain in the side was extremely acute; there was no cough. From the history of the disease, the physician discovered immediately that it was a malignant intermittent, masked by the predominant symptom of pleurisy; not being able to strike immediately at the root of the disease, because the exacerbation was then at its height, he employed himself in moderating the violence of the symptoms. He drew from the arm of the affected side ten ounces of blood, which was covered with an inflammatory crust, and ordered an emollient cataplasm to be applied to the part
where the pain lay, and to be frequently renewed. Internally he administered barley-water with oxymel and nitre; the patient experienced relief, his respiration became easier, and the pain in his side abated; yet he passed a sleepless night with heat and great thirst. On the day following, his pulse was indeed less frequent, and was not hard, yet he had a high fever; the pain in the side continued, the urine, which was very high colored, deposited a lateritious sediment; the symptoms were now much milder, but as they had not altogether disappeared, the foregoing remedies were continued. In the evening, the disease resumed completely its first state and appearance. On the morning of the following day, there was no remarkable change, except that the acute pain in the right side disappeared for a short time, but soon returned again; the urine had undergone no change since the day before, the skin was constantly cold, etc. Lautter discovered immediately the malignant character of the fever. He took advantage of the remission to administer an ounce of the bark in the space of twenty-four hours; the next paroxysm was a very moderate one; and by continuing the use of the same remedy, the disease was radically cured.

A woman, sixty years of age, having her system greatly heated by exercise, exposed herself imprudently to the coolness of the evening. She was attacked by a cold fit, which was followed by a fever of great intensity. A severe pain occurred in the right side, extending round to the spine; a dry and frequent cough added to its acuteness; the respiration was short and laborious, and the succeeding night was passed without sleep. Lautter was called in; he found the pulse greatly agitated, full and hard, the tongue white and dry. Taking the disease for a pleurisy, he drew blood from the arm of the side affected, and laid an emollient cataplasm on the part
where the pain was situated; the blood was covered with an inflammatory crust. The symptoms became milder.

On the same day, at one o’clock in the afternoon, the shivering returned with a slight degree of coldness; the febrile heat, the cough, the pain, etc., were all augmented; the pulse was as full and as hard as at first; blood was consequently drawn a second time, and exhibited again an inflammatory crust. There was now a remission of the febrile symptoms. On the evening of the day following, the cold fit returned; the pain, the heat, the cough, etc., increased considerably, in consequence of which the patient passed a very bad night.

Next day there was a remission; afternoon, another exacerbation, ushered in by a cold fit. The physician contented himself with repeating the application of cataplasm, and administering cooling drinks. He had no further recourse to blood-letting, because the patient’s strength was greatly exhausted, and from the progress of the disease and the copious sediment of the urine, it was easy to discover a double tertian remittent lurking under the mask of pleurisy. Lautter gave an ounce of a mixture of bark to be taken previously to the return of the paroxysm which was very near at hand. During the succeeding night, the patient experienced only a great heat, but the cough and the pain in the side did not increase. On the following day, the same medicine was continued, and there was scarcely even the shadow of an exacerbation. By the continued use of the bark, the patient was very soon restored. (A treatise on malignant intermitents, by J. L. Alibert, translated by Charles Caldwell, M. D.; Philada., 1807: pp.46-50). Alibert in the same connection recounts a similar case of intermitent pneumonia, occurring in a student of medicine in Paris, which was successfully treated by wine and bark.
Laennec observed the existence of intermittent malarial pneumonia (pernicious pneumonic fever) in a muscular, robust man, who had entered the hospital with a recent syphilis. On the sixth day of his admission, the patient suffered with a paroxysm of intermittent fever of considerable violence, and he stated that he had had a paroxysm two days before. A third paroxysm occurred on the third day after, but it was entirely different from the preceding paroxysm; it commenced with a more considerable chill, was accompanied with a violent headache, extreme dyspnoea, and hemoptysis. Upon exploring the chest during the middle of the paroxysm, the respiratory murmur was found unaltered except at the root of the lungs, where it was masked by a *rale crepitant* well characterized, principally on the right side. Laennec, without hesitation, declared the disease a double pneumonia in its initial stage: tartar emetic, six grains; sulphate of quinine, eighteen grains, to be taken in three doses. The patient vomited a little and had but one stool; the next day he thought himself cured. But as the *rale crepitant* had not entirely disappeared with the cessation of the febrile paroxysm, the two prescriptions were continued. The following paroxysm was very short; the *rale crepitant* was slightly developed, and the hemoptysis reappeared; but the fever had scarcely ceased, when all the symptoms disappeared (that is to say, as soon as the disease ceased, it no longer existed). The tartar emetic was discontinued on the fifth day, the respiration having become pure and natural; the sulphate of quinine was continued for some days. The patient was now cured of the fever, and the anti-syphilitic treatment, which had been suspended, was resumed. Three weeks after, the intermittent fever reappeared; it was now simple and benign, and a few doses of the sulphate of quinia entirely arrested it; the patient remained six weeks longer in the hospital, and left in.
good health. In like manner M. Fleury records a remarkable case of tertian pneumonia, which was attended with almost complete disappearance of the distressing pneumonic symptoms during the intermission of the fever, and which was arrested by quinine and bark. (See Physiological Pyretology; or a Treatise on Fevers, etc., by F. G. Boisseau, trans. by J. R. Knox, M. D.; Phila., 1832; pp. 483–486.)

We might present the testimony of many other writers, as Ramazini, Lancisi, Sydenham, Hunham, Sauvages, and Broussais, to show that the notion of the production of pneumonia, by the same causes which generate the various forms of malarial fever, has been not only long, but widely held by the medical profession; but the authors already cited are believed to be sufficient for the establishment of this proposition.

Without attempting at this time to settle the question as to whom belongs the honor of first giving bark and quinine in pneumonia and inflammations generally, we have shown conclusively that the former remedy has been freely used in the treatment of all fevers and inflammations for at least a century; and as the principles which led to its administration did not differ materially from those which now lead to the use of quinine, and as the bark necessarily included this constituent, if any eredit is due to this method of treating inflammations, it rests with the older writers.

We will endeavor in the next place to determine the relations of malarial fever to pneumonia, by the application of those facts and principles which have been developed by our own investigations.

We shall content ourselves with the expression of only those general results of our investigations which bear upon the treatment of pneumonia.
1st. There is no necessary connection between pneumonia and malarial fever.

In healthy, elevated non-malarious regions, pneumonia is almost never complicated with malarial fever.

In malarious regions on the other hand, pneumonia is frequently complicated with malarial fever. The local inflammation frequently appears in those who are laboring under the action of the malarial poison, and the disease partakes of the paroxysmal character.

If the system of healthy individuals be reduced in malarious regions, by any depressing agent or disease, as by the amputation of a limb, or by the inflammation of some organ, as of the lung in pneumonia, the malarial poison is most likely to exert its effects. In such cases the paroxysmal character of the inflammatory disease is due not to the pre-existing action of the malarial poison, but to the fact that the system has been so depressed as to be unable to resist the action of the malarial poison.

2. The malarial poison induces profound alterations in the constituents of the blood.

Under its action, the colored-blood corpuscles are more rapidly, and to a greater extent, destroyed than in any other disease. The fibrin is diminished and altered in quality. The albumen is in like manner diminished. The extractive and coloring matters of the blood are frequently increased. The unhealthy hue of the complexion in malarial fever, appears to be due to both the destruction of the colored-blood corpuscles and the presence of coloring matters in the blood.

3. During the active stages of malarial fever, phosphorus and the compounds of phosphorus in the nervous structures and in the colored-blood corpuscles, as well as sulphur and the compounds of sulphur in the muscular structures, undergo more rapid changes than in the normal state, and phosphoric acid and the phosphates, and sulphuric acid and the sulphates, appear in increased quantities in the urine.
The waste of phosphorus and its compounds in the blood corpuscles and nervous structures during the active stages of the fever, is far greater than the supply of these elements through the food.

The nervous disturbances and debility characteristic of malarial fever are in a measure, if not entirely, due to these rapid changes in the phosphorescent materials of the nervous structures and especially of the central ganglionic cells.

4. During the slow action of the malarial poison, as well as during the active stages of the paroxysm, important changes take place in the liver and spleen.

In both organs, the colored-blood corpuscles are destroyed in large numbers, and the coloring matter, resulting from the disintegration of the red corpuscles, accumulates in them, and in conjunction with other changes in the nutritive processes of these organs, produce those characteristic alterations of the normal color. In fatal cases, cellulose is found in both the liver and spleen, whilst grape sugar is absent from the liver. The bile is altered both in chemical constitution and physical properties.

5. That the chemistry of the body is still farther deranged in malarial fever, is evidenced by the changes in the excretions.

During the chill, and at the very commencement of the hot stage, phosphoric acid disappears almost entirely from the urine; as the hot stage progresses, and the febrile action and the heat commence to decline, there is an augmentation of phosphoric acid.

But what is still more important in its bearings upon pneumonia, the uric acid is either increased, or remains at the normal standard, during the chill; disappears almost entirely during the fever; and then increases rapidly, and rises to a high figure, after the subsidence of the febrile excitement, and often continues for days, two, three, and even six times more abundant than in the normal state.
If it be true that the presence of a morbific material in the blood, as uric acid, in gout and rheumatism, will often prove an excitant to inflammatory action, this tendency in malarial fever to the generation of large quantities of uric acid during the intermissions, and even during the period of convalescence, is important in its bearings, not only upon pneumonia, but also upon neuralgic affections.

I have in my own case observed changes in the urine, and especially in the uric acid, during severe headaches of malarial origin, similar to those observed in well-defined cases of paroxysmal fever.

6. One of the most marked and important of the phenomena of malarial fever, in its connection with inflammations of internal organs, is the congestion of important organs at stated intervals.

It would even appear that, aside from the general depressing effects of the malarial poison upon the heart and circulatory system at stated periods, and the consequent stagnation of the blood in the central portions of the circulatory system, the altered blood corpuscles, and the products of their death and disintegration, as the coloring matter, may under certain conditions obstruct the smaller vessels, and give rise to local and circumscribed congestions and even effusions.

It results from these effects of the malarial poison:

(a.) When inflammation is excited from any cause, in a system subjected to the influence of the malarial poison, the natural tendency is for the inflammation to assume a low form, from the altered condition of the constituents of the blood and structures, and from the derangements in the processes of nutrition, and of those physical and chemical acts by which the nervous and muscular forces are developed.

It is well known that the causes which are most influential in the production of inflammation are such as enfeeble the heart, impair the tone of the arteries, reduce
the activity of the secreting organs, and debilitate the muscular and nervous forces.

Imperfect nourishment also, either in consequence of the defect in the quantity or quality of the food, or of incapacity of the digestive powers, impairs the powers of the system to resist the effects of deleterious and depressing agents, as cold; and produces a liability to low forms of inflammation and fever, and to various epidemic and contagious disorders.

In malarial fever, even when the digestion is unimpaired, the action of the poison, by impairing the constitution of the blood, and by deranging the nutritive processes of the different organs and tissues, and by deranging and depressing the chemical actions concerned in the development of the physical and nervous forces, produces similar results to those witnessed in ill-fed and ill-conditioned beings.

The process of inflammation, whilst including both congestion and determination of blood, is essentially more complex than either or both of these conditions, and includes changes of the blood within the vessels, and changes of the relations of the capillaries to the blood, and of the blood to the surrounding tissues.

The character of these changes, as well as the extent and progress of the inflammation, will depend upon the constitution of the blood, the forces moving that blood, and the condition of the forces active in the nutrition of all the organs, as well as of the forces especially active in the inflamed tissue. Thus, when the character of the blood has been altered and the forces depressed, the solid products of inflammation are less capable of organization, the lymph effused possesses inferior plasticity, and the effects of the local inflammation upon the general system, in causing inflammatory fever, are more depressing and dangerous. As therefore the tendency of the malarial
poison is to derange the conditions upon which the maintenance of healthy nutrition depends, viz.: the regular supply of healthy blood possessing a definite composition and relation of its elements, and of a certain supply of physical and nervous force, and the healthy constitution of the organs and tissues, it is evident, not only that inflammation engrafted upon the system laboring under the effects, or under the direct action of the poison, must be correspondingly altered from its progress in the healthy constitution, but also that the state of the system induced by the action of the malarial poison is conducive to the origin of inflammation.

(b.) *From the destruction of the fibrin and red-blood corpuscles, consequent upon the action of the malarial poison, the tendency of inflammations excited in systems under the influence of the malarial poison is to diffusion.*

The increase of fibrin in the blood, and in the inflamed structures, appears to be destined, in the economy of nature, to limit and circumscribe the inflammatory action, by the fibrinous matter thrown out within and around the inflamed part.

The colored-blood corpuscles, which crowd the inflamed part, appear to contribute by the chemical changes which they excite, and especially by the increased oxidization of the protein elements, to the formation of fibrin, which in this view may be considered as one of the controlling and limiting elements of inflammation. Whatever therefore tends to diminish the red corpuscles and fibrin, tends to interfere with the natural processes employed by nature in the limitation of inflammation, and directly promotes the diffusion of the inflammation over a greater extent of tissue, and in a corresponding degree renders it more severe and dangerous.

We have in these facts an explanation of the sudden and fatal character of many cases of pneumonia occurring
in those who have been for some time under the influence of the malarial poison.

We have had under treatment, and recorded at length elsewhere, cases which were suddenly seized with pneumonia during the period of convalescence from malarial fever. These patients were destroyed, or rather drowned, by the rapid pouring out of serous fluid into the air cells and bronchial tubes of the lungs. In such cases, the capillaries of the blood, being in an enfeebled state, the fibrin of the blood being diminished in quantity and altered in physical and chemical properties, the colored-blood corpuscles, being diminished in number and physically and chemically altered, the solid matters of the blood having been diminished, and the physical and chemical relations between the individual constituents of the blood and capillaries having been disturbed by the action of the malarial poison, _healthy limited inflammation was impossible._

Diffused inflammation of all the structures of the lung resulted, the serous portion of the blood poured into the air cells, bronchial tubes and trachea; the supplies of oxygen were in a great measure cut off; the chemical changes of the solids and fluids were in a corresponding degree checked; and the physical forces, heat, and electricity, and the nervous force, developed by these chemical changes, were, as a necessary consequence, correspondingly diminished.

Broussais, in his history of chronic phlegmasiæ, has recorded several analogous cases of fatal pleuritic and pulmonic affections attacking those suffering with malarial fever; and Andral, in his "Clinique Medicale," has given at length a fatal case of pneumonia, with pulmonary oedema and double pleuritic effusion following and supervening upon intermittent fever.

(c.) _The liability of persons who have suffered with malarial_
fever in the Summer and Fall, to be seized with pneumonia, in the Winter and Spring, and the danger of these inflammatory attacks following or engrafted upon paroxysmal fever, have long been known to the public as well as to the profession.

In many cases, these inflammations engrafted upon malarial fever, or following its effects, are clearly dependent for their excitation upon the vicissitudes of the weather, and especially upon the agency of cold.

In healthy beings exposed to cold, there is at first, through the stimulating effects of the cold air inspired, and of the change of temperature upon the exterior, an increase in the circulating and respiratory actions, more oxygen is introduced and distributed, the chemical changes of the system become more rapid, and the temperature of the body, notwithstanding the increased radiation and loss of heat, is maintained at the normal standard by the increased chemical actions. As long as the fixed normal temperature of health is maintained in the trunk and important organs of animal and vegetable life, no evil results follow. If, however, through the prolonged action of the cold, the materials capable of keeping up the temperature be exhausted, or if the nervous and muscular forces be so depressed that the respiratory and circulating actions are so impaired, that the materials are not distributed with sufficient volume and celerity to maintain the necessary chemical changes to preserve a fixed temperature, the heat of the body gradually descends, not only by progressive conduction and radiation, from the exterior to the centre, as in an inanimated cooling body, but the chilled blood circulating in the vessels of the exterior, and in the capillaries of the lungs, mingle with the mass of blood in the interior, and still farther and more rapidly reduces the temperature of the great central organs. At the same time, the contraction of the vessels distributed through the superficial
structures, under the prolonged action of cold, forces the blood inward toward the largest venous receptacles, and thus induces a state of congestion in the central organs.

It is a well established fact, that a fixed temperature is absolutely necessary to the maintenance of the healthy nutrition of the tissues, to the proper performance of the functions of secretion and excretion, and to the regular and active development of the nervous and muscular forces. Not only by the congestion of the internal organs, but also by the disturbances induced in the chemical and physical processes concerned in secretion and excretion, by the loss of that amount of heat or physical force, which is one of the essential conditions to those actions, do those changes in the mutual relations and constitution of the blood, and capillaries, and organs ensue, which frequently result in the establishment of inflammation. And it is not unreasonable to suppose that, during such disturbances, chemical products may be formed, of a totally different character from those of the healthy organism; just as in the laboratory, with the same organic materials, different products are formed under different degrees of heat; and also, that the excrementitious matters necessarily resulting from the nutrition of the organs and development of the forces may be retained in the blood and structures, from the congestion of the kidneys, and the impairment, if not total cessation of the function of the skin consequent upon the constriction of its pores and vessels, and diminution of its nervous supplies, following the reduction of temperature; and still farther, that these altered products and excrementitious matters may irritate certain organs and excite in them inflammation.

As, therefore, the malarial poison destroys those constituents of the blood and nervous system most intimately associated with, and necessary to, the generation of heat,
and of all the nervous and physical forces; and as it farther depresses the nervous and muscular forces, and the action of the heart, and the tonicity of the arteries, and tends of itself to induce congestions of the internal organs, it is evident that it renders its victims, when exposed to the vicissitudes of weather, and especially to the prolonged action of cold, exceedingly liable to inflammations.

(d.) The action of the malarial poison is attended, not only with derangement in various nutritive processes, but also with the generation of increased quantities of the urates.

In like manner, in inflammations existing in healthy organizations, when resolution takes place, there is an increased excretion of the urates.

If, therefore, the existence in the blood, and non-elimination of these excrementitious bodies in certain diseases, as gout and rheumatism, tend to excite local inflammations, it is but reasonable to suppose that their non-elimination from any cause, as from the effects of cold, previously described, may, in like manner, tend to excite local inflammations in those suffering from the effects of the malarial poison.

(e.) After the excitation of Pneumonic Inflammation from any cause, the periodic changes, and especially the periodic congestions of the internal organs, induced by the action of the malarial poison, tend to aggravate and increase the inflammation.

During the cold stage, the blood stagnates, and accumulates in the capillaries of important organs, because the blood has been altered by the malarial poison and the changes which it induces: because the relations between the blood and its containing vessels, especially the capillaries, have been disturbed; because the regular normal chemical changes necessary for the development of the forces which work the machinery are not generated with sufficient energy, or if generated, with even
increased energy, they are not generated in the right position and in the proper quantities, and the correlation of the physical, chemical, nervous and vital forces is thus deranged; because the action of the sympathetic nervous system which accompanies the blood vessels, and regulates the circulation, and respiration, and secretion, and nutrition, and excretion, and relates them to each other, and to the cerebro-spinal system, has been disturbed by the direct and indirect action of the poison, by the direct action of the poison upon the sympathetic and cerebro-spinal nervous systems, or by the relations of the chemical changes induced, or the products generated in the constituents of the blood by the malarial poison, to the sympathetic and cerebro-spinal nervous systems.

From these facts and considerations, we arrive at the following practical conclusions:

First. Whilst the malarial poison cannot be said directly to produce pneumonia, still it is capable of inducing such changes in the blood, and in the nutritive and excretory processes, as to predispose the system to this and other inflammations. And therefore,

Secondly. The physician should never in the treatment of pneumonia, in those who have been exposed to the action of malaria, lose sight of its effects in complicating inflammation of the lungs, and of the consequent necessity of arresting at once, if possible, the farther action of the malarial poison.

As no remedy can compare with quinine for the accomplishment of this result, its use would in the present state of our knowledge appear to be imperatively demanded in the treatment of pneumonia arising in malarious regions, and presenting well marked and recurrent paroxysms.

This remedy may be indicated even when the patient has exhibited none of the symptoms of malarial fever, before the appearance of the inflammation, for it is well established that the malarial poison may be present in
the system without manifesting any effects sufficient to excite the attention of the physician or patient. Thus, mechanical injuries in those who have been exposed to the action of malaria are frequently attended with the appearance of paroxysmal fever. Whilst the strength was unimpaired, the system resisted the morbid influences of the poison; but when the forces were reduced, by the injury and the consequent inflammation, then the effects of the poison were manifest. In like manner the depressing effects of the pneumonic inflammation may so weaken the forces as to bring the system under the dominion of a poison, which it had before resisted.

Thirdly. In the treatment of pneumonia in malarious districts, the physician should never forget the similarity, in some important respects, between the effects of the malarial poison and general blood-letting.

The malarial poison, whatever it be, destroys rapidly the colored-blood corpuscles. Whatever, therefore, diminishes the colored-blood corpuscles, acts in concert with the malarial poison.

General blood-letting more rapidly diminishes these important constituents of the blood, so essential to healthy nutrition, to the maintenance of the nervous and muscular forces, and to the successful progress and resolution of inflammation; because the colored-blood corpuscles rush along chiefly in the centre of the vessels, and are evacuated more abundantly than the other constituents of the blood.

The malarial poison also reduces rapidly the forces.

General blood-letting reduces rapidly the forces.

The two, in this particular, again act in concert.

We would not, however, deny that circumstances may arise where blood-letting, and especially local blood-letting, would be beneficial in malarial fever, and in pneumonia complicating this disease. Whenever blood-letting
is used, it should be borne in mind that it does not, and cannot, cure malarious disease; its beneficial action is only temporary, and so far from curing the disease, the relief which it has temporarily afforded will vanish, if other remedies, especially the sulphate of quinia, be not used; and as a general rule, without these remedies, the patient will be in a much worse condition than if the blood-letting had not been employed.

In considering the use of general blood-letting in malarial fever, we should ever remember that the cerebral symptoms, the delirium and the torpor of the intellectual faculties, and the congestion of the internal organs, are not inflammatory; they are not due to an exaltation of the functions, or to an irritation of the congested organs, but rather to a loss of power in the circulatory apparatus, heart, arteries, capillaries, and veins, and to disturbances in the physical, chemical, and nervous forces. Hence, therefore, in pneumonia, complicated with malarial fever, we will best guard against those dangerous periodic changes and congestions, not by depleting, but by stimulating and anti-periodic remedies.

Fourthly. It results from all this, that stimulants and nutritious diet are especially indicated in pneumonia, complicated with paroxysmal fever.

The nutritious diet supplies the elements of the blood which have been destroyed; and the stimulants not only arouse the depressed nervous system, and through the sympathetic and cerebro-spinal ganglia, excite the circulatory system to a full and salutary action for the introduction and distribution of the elements of nutrition and secretion so necessary to the favorable progress and termination of all inflammations, but they also preserve the elements of the blood and tissues from too rapid chemical change and destruction, by taking their places, and themselves undergoing the chemical changes which are for the
development of the physical forces which work the machinery.

Fifthly. Quinine may arrest inflammations, or promote their resolution by other modes than its anti-periodic powers, as by its sedative and excretory powers, or by its influence upon the nervous system and capillary and general circulations.

If the value of this agent in the treatment of inflammation depends upon some such powers other than its anti-periodic effects, then the important result is reached, that this remedy is valuable in non-malarious, as well as in malarious regions.

Upon this question, however, we need definite experiments and investigations.

We hope at some future time to present the results of experiments upon the effects of quinine, both upon the healthy and diseased organism, designed to elucidate those important questions concerning its mode of action.

Finally. We need, above all things, careful records of the results of the treatment of pneumonia with quinine in full doses.

As far as my knowledge extends, no well established data exists by which we may determine the relative merits of this agent in the treatment of pneumonia. I have heard experienced and intelligent physicians affirm that, in private practice, when this drug was used energetically in the early stages of the disease, not more than one case in fifty would prove fatal. This is surely an extraordinary result, and far different from the results of the treatment of pneumonia in the Confederate hospitals, which, it must be confessed, as shown by the hospital records themselves, are bad enough; and in fact, no better, and even worse, than the heavy mortality characteristic of the rigid anti-phlogistic method with bleeding, blistering, calomel, and opium, and tartar emetic. The Confederate Surgeons did not use blood-letting to any extent in the treatment of pneumonia, and in many cases
of this disease employed quinine, stimulants, and nutritious diet.

In our own practice, civil and military, we have used quinine freely in the treatment of pneumonia, and especially in those cases which were complicated with malarial fever, and apparently with marked benefit and highly favorable results, but we are inclined to the opinion that a large share of this success was due to two facts, viz: quinine, a comparatively innoxious, and at the same time a tonic medicine, was substituted for the heroic and poisonous drugs so extensively employed in the treatment of pneumonia, and our patients were supplied with nutritious diet, and the strength was supported; in other words, depressing agents were withheld, the strength was supported, and nature was allowed to have her perfect work.

The Confederate statistics demonstrate that but little confidence can be placed in the dogmatic assertions of practitioners, apart from a careful record of cases and the preservation of the actual statistics.

The careful determination of the value of quinine in the treatment of pneumonia, as well as the best mode and period of its administration, as well as the relative action of this agent in malarious and non-malarious regions, should engage the careful attention of Southern physicians.

In the institution of any investigations into the relative value of quinine in the treatment of pneumonia, the following well-established facts are worthy of constant consideration.

Uncomplicated pneumonia, especially in young and vigorous constitutions, almost always gets well, if instead of being lowered, the vital powers are supported, and the excretion of effete products assisted.
From the accounts which have been published concerning the natural progress of pneumonia, it would appear that very slight cases of limited inflammation may be convalescent on the seventh day; that the majority of cases of medium intensity recover between the seventh and fourteenth days, and very severe ones between the fourteenth and twenty-first days.

In the report of the cases, the extent and character of the inflammation, together with the symptoms, progress, complications, and termination of the disease, as well as the exact period of its commencement and the establishment of convalescence, should be noted with scrupulous accuracy.

Without the careful record of these points, the value of such investigations will be greatly impaired.

**ARTICLE VIII.**

*Suggestions made to the Medical Department. Modifications of treatment required in the management of the Confederate Soldier, dependent upon his peculiar moral and physical condition; with a reference to certain points in practice.* By F. Peyre Porcher, M. D., Surgeon in charge City Hospital, Charleston. Formerly Surgeon in charge of the General (Naval) Hospital, Norfolk Harbor, and the South Carolina Hospital, Petersburg, Va.

[This paper was prepared just before the close of the war, by direction of the Surgeon-General. He is not responsible, however, for the opinions contained in it, as it reached his office at a very late period, and could not be acted upon by that able officer. Though written with a view to impress upon surgeons greater attention to peculiarities which were believed to be characteristic of the soldier of the Confederate army, and which could not be neglected in his treatment without detriment, it is believed that many of the considerations contained in it apply, not only to all those engaged in war, but to others employed in civil practice.

In recalling to the memory some of those sad deficiencies which were as fatally prevalent as they were easily remediable, it affords a warning to those coming after; whilst it gives a medical officer an opportunity to pay a slight tribute to the exceeding heroism of the Southern soldier.]
I wish to make my remarks as brief as possible. I enter upon them with the greatest diffidence; and would most cheerfully commit the task to abler hands—but the conviction is so strong upon me, the results of my own experience strengthened by conversation with a number of surgeons in the army, that I am induced to offer them for the benefit of the junior members in the medical department.

Whatever follows is written for the good of the service, and any personal allusions are disclaimed. The relations of the writer to those he has had the honor to have under his control, or with whom he was officially connected, have very generally given him the greatest satisfaction; and he is enabled to testify to the zeal, fidelity, and ability with which they performed the duties entrusted to them. Differences of opinion, nevertheless, on points connected with therapeutical indications, pathology, or the policy of measures, might sometimes very properly and naturally arise and be discussed with advantage.

There are certain prime fundamental facts connected with the soldier, as he offers himself for treatment, which require to be brought to the attention of the surgeon, in order that he may be thoroughly impressed by them; and that the sick and wounded under his care should continually feel their influence. They are of the very highest importance, and therefore, life or death, recovery or tedious convalescence depend upon their constant observance. That I undertake their presentation and recommend their enforcement, is simply because no one else, at this late date, has come forward to give expression to them.

The success of a medical man, or his want of it, depends upon the doctrines he entertains. His theories, views, abstract ideas even, govern and control his practice. For this we have the authority of the greatest of English philosophers, Lord Bacon, quoted by Mialhe: "Si les
Porcher's Suggestions.

expériences ne sont pas dirigées par la théorie, elles sont avengles; et si la théorie n'est pas soutenue par l'expérience, elle devient trompeuse et incertaine.” Not only the selection and administration of medicines, the therapeutical or surgical appliances, but also the general care which he bestows, or sees that others under him bestow, upon the sick, are determined by the opinion which he entertains of their necessity. We must, therefore, endeavor to modify his views respecting the relative importance of certain agents employed by him, if, when carried into practice, the results seem injurious or fatal. I will first invite attention to the secondary rank held by medicines in comparison with other agencies.

*Medicines* are not the only agents that are successfully used in the cure of the sick—many things besides, a knowledge of which is obtained by observation, reading or experience, under the control of common sense, are also absolutely necessary to their recovery.

The seeing to the proper observance of other general and particular directions are equally as essential as the administration of drugs at stated times. The surgeon, or assistant surgeon, who merely visits his wards, examines his patients, prescribes secundum artem, orders the routine administration, and dismisses the patient and attend-ant until the usual hour for a repetition of his visit, has only acted the part of a formalist, and he cannot be successful. In the case of those critically ill, there are a great many directions respecting the proper administration of food and stimulants, the maintenance of warmth, avoidance of exposure, improper getting up, etc.; all involved in the comprehensive word, management, that are of the first importance, and need to be pressed most forcibly upon the attention of nurses and wardmasters. These are even more strongly the duty of the surgeon,
because they are likely to receive little regard from subordinates, whose duty it is to carry them out, but who naturally pay little attention to them in comparison to their minds, the vastly more important consideration, of duly administering the medicinal agents. However wardmasters may look to them as supreme and the only effective weapons, the sick cannot get well upon medicines only. They do not cure. They are essential in the cure: for they tend to restore the diseased organs to a condition of health through the perturbative influence in modifying secretions, acting upon glands, producing catharsis, diuresis, diaphoresis, lessening pain and irritability, checking secretions, etc. Thus removing materies morbi, urates, phosphates, dropsical accumulations, serum, and other effete substances, the products of digestion, of metamorphosis of tissues, of destruction of proteine compounds, combustion during fever, inflammation, and so forth.

But after all, food is the principal agent which assists in the cure, and its administration in proper quantity and quality is of prime and absolute importance, in comparison with which all other means sink into insignificance. If this is a truism, it has been singularly slighted in our army, and the effects have been disastrous. Recovery in the great majority of cases is brought about through the instrumentality of the digestive organs; by the restoration of the activity of the absorbents, of the venous rodicles of the gastric and mesenteric veins and chyle ducts, the proper sucking up in the digestive track of the "raw material of the blood," which must at all hazards be supplied, and which alone is gifted with the power to restore wasted muscle, blood, brain, nerve substance, adipose tissue—which, in a word, brings the patient back to a state of health. The great object of all our therapeutic efforts in the large proportion of cases occurring
among soldiers is to restore the diseased organs, particularly the intestinal canal and its appendages, to that condition of integrity by which they can absorb and assimilate food, recuperate the exhausted and impoverished system, and repair the waste produced during the course of the disease. Even in purely surgical cases the sufferer must ultimately depend solely upon the sustenance afforded by the same set of organs to rehabilitate his frame, and it is through the instrumentality of nourishment alone that the drain produced by excessive suppuration is neutralized. I do not magnify, therefore, the necessity of maintaining them intact and of supplying the pabulum required.

Food must be procured and administered, or all other exertions prove futile. It should not be left to the matrons or nurses to parade three times a day, at meal time, to divide out and distribute the customary ration. Those sick a long time with acute or wasting diseases, so common among soldiers, should receive suitable nourishment by an inexorable rule at frequent intervals, day and night, even in small quantities, as the only means of their rapid and effectual recovery. An attention to this point is of greater importance than any other single consideration which belongs to the treatment of the sick soldier.

Let us examine into the principles upon which these views are based, and if correct, let them be urged most strenuously upon the attention of every officer in the service, who is by any possibility likely to disregard them.

What is the most obvious and striking peculiarity of a very large proportion, nearly all, indeed, of our soldiers who are brought into an infirmary or hospital for treatment? The dominating fact which must impress and modify the whole course of treatment to which any judicious surgeon would subject him, unquestionably is prostration. This is
accompanied by weakness, nervous irritability, loss of flesh, the result of bad food, or of food insufficient in quantity, and of unusual privation and exposure to cold, to wet, and to depressing emotions. Chronic diarrhoea has also previously existed, or is present, in almost every case. _Exhaustion_, then, is the great characteristic as well as the essential element to be considered and combatted. In the soldier it may very properly be called chronic—almost every act of his military life has tended to produce it. Its repair must consequently be kept in view by the surgeon at all times, at every moment, and in every procedure which he puts in practice for his relief. Surgeons in the Confederate army will acknowledge this to have been eminently the characteristic feature in the pathological condition of those brought under their care, and yet many of them instituted no modification of treatment based upon this prime fact in their history.

The medical officer of the present day, practicing in the army, who loses sight of this; who is not thoroughly seized and possessed with the idea of unusual prostration and feebleness in the vast proportion of his cases; who disregards the essential previous and present condition of his patient, so markedly adynamic, has committed a grievous error. If adopting exclusively the teaching of any favorite author, he will carry out upon such sufferers the written instruction of works not devoted to the consideration and treatment of the diseases incident to the _soldier_, or which fail to recognize this feature of their condition, he is pursuing a vicious and ruinous system. If his mind is filled with the intention to test all those long lists of prescriptions which he has been in the habit of employing in civil practice—the same sugar of lead and opium, the same infallible calomel, five grains every three hours, the same drastic cathartics, without a moment's attention to the special peculiarity of the man before
him, is most grievously at fault, and his efforts must prove unsuccessful or be attended with disastrous results. The correctness of these cautions, the reality of the principles upon which they are based, and the necessity which exists for their dissemination, has been acknowledged to the writer by nearly every intelligent officer with whom he has conversed.

Of course, individuals differ, and varying degrees of robustness, constitutional vigor, stamina, etc., are found to remain in those coming under the care of the military surgeon; but even in cases apparently most favorable for the use of a depletive, purturbarive, or anti-phlogistic course, there should be a reticence with respect to the employment of active medicines. By an almost absolute rule the mildest and least irritating should be selected and used in the smallest quantities; they should be diminished or discontinued as soon as possible, and they should be combined, or neutralized, by those agents, dietetic, medicinal, or regiminal, which support and give tone to the system. Throughout the treatment of almost every case nourishment, however small in quantity, should be introduced at appropriate intervals. Even in controlling by medicines whatever amount of inflammation there may be present, we must constantly seek to strike that nice balance, that delicate boundary line, which marks how far we can go and no farther. Here the judgment of the experienced and enlightened physician is capable of its finest displays and is exercised with the best results. Let the surgeon be prone to employ external means as substitutes for internal, to avoid all weakening, depletive treatment, all irritating cathartics; in cases of fever, let him use cold effusions assiduously, mild, cooling, catalytic agents, renal depuratives, salts of potash, chlorate of potash, neutral mixtures, milk, eggs, beef tea, brandy, milk punch, etc. Vegetable astringents, turpentine, etc.,
guarded by opium and demulcents may also be required; neither must he depend solely upon stimulants, and attempt, at the last moment, to save life by them.

In treating ninety-nine soldiers out of every hundred the great object of the surgeon should be to follow Chomel's golden maxim and do him no harm. He must strive to administer the remedial agents that appear to be, and are necessary, in barely sufficient quantities to diminish the existing disease without impairing the integrity of the digestive and assimilatory functions, through the instrumentality of which alone, he knows (if he thinks at all), that he must depend for the subsequent restoration of the patient. He must remember that the subject is not a hearty countryman, recently let loose from "fresh fields and pastures new," with rich and florid blood, and actually suffering from an overabundance of phlogiston, but on the contrary, that he is precisely in the opposite condition. He has been reduced by all the usual privations of the soldier's life. These are aggravated by circumstances in the case of the Confederate soldier, which are almost peculiar to him, namely: want, exposure, its attendant depression, and toil, oftentimes prolonged to a degree from which he has finally succumbed through sheer breaking down of the powers of life. If he must be physiced, let it be done most tenderly and charily.

Let his remaining vital forces be husbanded by every means in the power of the attendant. It is more important that he be builded up, strengthened, and sustained at every convenient opportunity by stimulants and nourishment. These should be secured by every personal exertion of the surgeon in charge, and his efforts should be directed to this all-important subject. He should never content himself simply with making the usual monthly requisition for medicines, but should devote every energy to procuring what is so obviously of equal, if not
far greater importance, namely: the proper supplies of those articles of food, upon the judicious and timely administration of which those under his care depend more than upon any other means at his disposal. He must send out agents; if need be, appeal to the ready or reluctant patriotism of the rich—buy, borrow, or beg—but they must be had. Those who take the trouble, generally succeed in obtaining what they wish.

If the surgeon is willing to content himself simply with conforming to the Regulations, paragraph so and so, he may neglect all this; he may pass for an excellent officer and may please all in authority over him who cannot look into the daily operations of his charge: for he can hand in at the end of every quarter the usual prescribed bill of mortality, nicely drawn out by his clerk on clean sheets of ruled paper—but he will still be far from performing his duty to his country or to his fellow-soldier. The chief weight of his responsibility does not lie with the medical department, the general regulations of which are important to any well-ordered establishment, but it lies with the great cause we are sustaining. A sacred and heavy responsibility is in his own bosom toward the sick themselves. Their span of life, as far as human efforts go, is in his hands; their parents, relatives, and friends look to the surgeon, that under the direction of an ably-managed and most admirably-conducted administration, he also uses every energy, devotes his whole soul to carry out his part of the duty he owes to those entrusted to his care. To the sick soldier he stands in loco parentis. If he has not entered con amore upon his labors; if, whilst looking after a thousand personal interests, present or prospective, he is lax, indifferent, and willing simply to save himself by only obeying orders and shunning mere military responsibility, he can get through very easily and seem to be a model officer. Through a careless or ignorant
disregard of the things most essential to success, the object and sole aim of his assignment to his post is entirely lost sight of, which is: saving life, if possible, by every exertion, and the returning to duty, in the shortest possible time, tuto, cito, et jucunde, those temporarily under his control. Our hospitals and infirmaries, in a provisional army constituted as ours is for an emergency, are not military hospitals in every sense of the term, to be controlled only by the stern rules of war; nor are surgeons enfants terribles, whose chief duty is to hold themselves unapproachable and aloof, in a cold and forbidden isolation, jealous of position, and hedged off by rank from the ignoble vulgus of the sick. Our cause is sacred; the common impulse is patriotism; our patients are our brethren, generally from the front, often with equal social position. They are temporarily inferior in military rank, only on account of the superior medical education of the surgeon, who needs only to restrain them within the bounds that military subordination, orders, and discipline have made advisable. The humblest private may be the true hero, worthy of our tenderest care, and all the kindness we can bestow upon him. In attending upon the sick or wounded, no office can be too servile, or degrade him that performs it.

We do not lose either in dignity, position or influence by being always accessible at the proper time. It is a painful spectacle to the humane surgeon to witness the fear, almost approaching to servility, with which a sick man, scarred by bullets, hesitates for days to approach the medical officer, who should be his friend and counsellor. Nor should we allow wardmasters, or other attachées, to lord it unnecessarily over those who are in a great many cases their superiors in every qualification which distinguishes a man, a gentleman, or a soldier.

Some men seem rather to delight in human misery, so
that it be military; and care not to smooth a path which is rough enough at best. Others are advocates for the enjoyment by every one of the greatest degree of happiness and comfort which is compatible with the general welfare. The Confederate surgeon should always place himself in the latter class, and whilst shunning too great familiarity or intimacy with subordinates, which generally leads to bad results, he should endeavor to make his hospital or infirmary a well-ordered asylum for the weary, the wounded, and the sick. Every privilege or kindness not conflicting with proper discipline and a safe return to duty should be extended to its inmates, with the studious avoidance of everything like a multiplicity of petty or worrying regulations, calculated only to distress or harrass those who have enough hardship to endure, whilst enjoying comparative health amid the dangers of the field. When a soldier becomes justly entitled to the privileges of a hospital, there should be a truce to all suffering save what is inevitable.

The ambition of superior cleanliness, whether it be a permanent or a spasmodic feeling, should not be pushed to extremes, and be considered the one thing needful in a hospital, lest it blind the eye to the absence of other things which are more important. The possession of the neatest and cleanest wards may co-exist with radical defects of the gravest character for outweighing the quality of mere cleanliness, which is very excellent.

All excessive medication, drastic purgatives, compound cathartic pills, calomel in large doses or long continued, should as a general rule be particularly avoided. Perseverance in medication, save that of the mildest character, should be eschewed. Even the pure medicine expectante system, which has been wittily styled a "meditation on death," is better than the old heroic one in a very large
majority of cases, marked as they are by the debility which I have described as the prominent characteristic. Having devoted many years to studying and teaching Therapeutics, the writer is far from uniting with the nil admirati school; he does not agree with either Forbes, Holmes or Bigelow, or with those who consider it a mark of superiority to deride all medical treatment as nugatory or mere guess-work. He firmly believes in the great value and essential importance of judicious and correct medication; and is of the opinion that Mialhe, Trousseau, Headland, Billings, Wood and Stillé, may be consulted with profit both by students and practitioners of medicine. To hold the doctrine, professed by some, but only in theory, that medicines are not beneficial, or that they do not either cure, or aid in the cure, is idle and not worthy of discussion—particularly before those who continue to order them so freely. Every case is susceptible of good or bad management, and there is a vast difference between the two.*

I repeat, that though medicines are essential and necessary, still they are not the only things necessary. In using them, especially upon such subjects as those with whom we are at present concerned, the doses should be far less in quantity than are, I fear, usually prescribed; nor should they be had recourse to so continually.

In giving calomel, for example, in alterative doses, $\frac{1}{6}$, $\frac{1}{4}$ or $\frac{1}{3}$ a grain, with $\frac{1}{6}$, $\frac{1}{4}$ or $\frac{1}{3}$ of ippeacuana, Dover's powder, or opium, three or four times, is amply sufficient

---

*M. Chomel, in his Elements de Pathologie Generale, Troiseme Edition, p. 582, Paris, article "Therapeutique," gives a most concise decision as to the effects of treatment. I commend it to those loose talkers of both extremes, generally men of a speculative turn of mind, and often without practical experience, who either decry or exalt the action of Therapeutical means.

Nous voulons dire seulement que nos moyens therapeutique n'ont pas une action directe contre la maladie, qu'ils n'agissent qu'en determinant dans l'economie des modifications en vertue desquelles s'opere le changement favorable qui prepare et achieve la guerison; l'extraction des corps etrangers et la reduction des parties deplacées font presque seules exception. En exposant cette doctrine, generalement admiree aujourd'hui, nous n'enlevons rien a l'importance de la therapeutique, et vous rendous a la nature ce qui lui appartient; egale-ment eglises de ceux qui donnent exclusivement l'honneur de la guerison, soit a l'art, soit a la nature, nous croyons que la concours de l'un et de l'autre et toujours utile et souvent indispensable.
for all purposes. The surgeon has to be particularly careful how he saturates such systems with mercury, or prolongs its use even in the minute quantities which the writer has found abundantly sufficient. The Surgeon-General of the U. S. Army probably did much more good than harm when he entirely prohibited the use of calomel.

Dr. Law's statement, that one grain of calomel in twenty-four powders, given at sufficient intervals, will produce as full or a greater effect than a larger quantity not so minutely divided, and frequently administered, is important, as it affords a practical deduction. For, as Mialhe describes its action, "Chimie appliquée à la Physiologie et à la Thérapeutique," it is through the instrumentality of the alcaline chlorides that mercury gains admission into the system, and only a proportionate amount is in a given period dissolved and absorbed. This change is for the most part effected in the liver.

Besides the great tendency to gastric irritability in many soldiers, the previous existence of chronic irritation of the stomach and gastro-intestinal mucus membrane renders an attention to this point respecting the quantity used especially important, as it allows the surgeon the earlier to retrieve the disastrous effects which so frequently follow large doses of the drug.

My hospital experience alone of ten years has convinced me that, however valuable, essential indeed, the occasional use of mercury may be—particularly when guarded by small quantities of opium or Dover's powder—with the simultaneous administration of alcoholic stimulants, yet when prolonged, even in small doses, it is to the mercury we may justly ascribe the diarrhoea and wasting discharges which very often carry off the patient. The persistent use of calomel is very frequently the direct and only cause of the irritation of the mucus
membranes marked by the "running off" at the bowels. The insidious and fatal colliquative diarrhoeas supervening in pneumonias, fevers, etc., are often the sole work of the inordinate and prolonged drugging. They are never beneficial; they diminish rather than promote the activity of the absorbents; cause the surgeon to lose time in the effort to arrest the discharges; and give rise to the worst inconveniences, even where they fail to turn the scale in the wrong direction.

I am not indulging in special pleading, or in the slightest degree pushing the advice to extremes, when I unite my voice with others in urging the whole corps of army surgeons who have not done so to test the use of mercury in doses of one sixth to one half a grain. Let the latter be the maximum amount when used for the alternative effect, as in cases of peritonitis, pleuritis, uretis, hepatigation in pneumonia, and other similar conditions. Two grains is far too large a quantity to be repeated every two or three hours for days, as it is not only injurious but useless. The minimum doses when carried to excess can be recovered from more readily by being sooner eliminated from the system through the aid of laxatives, the oxygen-bearing bodies, chlorate of potash or other catalytic agents. I doubt extremely whether calomel in ten-grain doses is ever borne by the Confederate soldier. Its repetition in this quantity is scarcely ever admissible, unless in an occasional case of obstinate engorgement of the liver or violent constipation occurring in a robust subject.

Let the idea be for ever exploded, especially in our military hospitals and infirmaries, peopled as they are, that each sick man is of necessity to have one or two "bilious" evacuations each day—or he must be dosed until he does. Such rules are bad enough even in the rural districts and among highly-nourished civilians. The
ordering calomel indiscriminately and upon every occasion for its supposed general applicability is simply atrocious.

If ptyalism is ever advisable, and it sometimes cannot be avoided, let it be only the very slightest mercurial effect, and not carried so far as to produce salivation. They remind one of the comparison instituted by the Jewish women between Solomon and David; the execution of each is great enough, though one may have only slain its thousands.

I append an extract which I had quoted from Stillé's Therapeutics, v. ii., in my Prize Essay, published by the South Carolina Medical Association in 1861.* Dr. Morehead's description should be written in letters of gold. I endorse in full the doctrine it conveys, and believe their adoption in practice would be a great boon conferred by the practitioner of medicine upon the people. It was only confirmed by my own previously-acquired experience during six years service before the war, in charge of the Marine Hospital, Charleston, in the General Hospital at Norfolk, and the S. C. Hospital, Petersburg, Va.:

"The cholagogue action of mercury is invoked in this affection to relieve the overloaded liver, as it is in yellow fever to stimulate the non-secretting liver. Leaving unattempted here the task of reconciling these apparent contradictions, let us endeavor to learn whether or not experience has proved mercurials to be useful in bilious remittent fevers. In reference to their purgative action, it may be remarked that this is generally sought for at the beginning of an attack, by the administration of ten grains of calomel at bed-time, and some saline laxative, or else jalap, on the following morning. But even at

*Illustrations of Disease with the Microscope—Clinical Investigations aided by the Microscope and by Chemical reagents, with Microscopical observations of Pathological specimens, Medical and Surgical, obtained in Charleston, S. C., with upward of 500 original drawings, made from nature: Natura maxime miranda in minimis—Linnaeus. Charleston, S. C., C. S. A.
this stage such treatment is unnecessary, unless the abdomen is full and hard, the tongue much coated, and the alonic evacuations sensibly disordered. In this disease the real remedy is quinia, and it is much better to obtain its specific operation as soon as possible, feeling assured that then the associated local derangements will be all the more readily removed.

"It may be presumed that the employment of calomel as a constitutional remedy in this disease, whether by the daily repetition of slightly laxative doses, or the more frequent administration of still smaller quantities, is still the general practice in some portions of the United States.* So far as these forms of the disease are concerned which originate in the Middle States of the Union, we have never found it necessary to prescribe mercurials except as purgatives, relying for the cure of the disease upon quinia alone. It is possible that the more inflammatory form of remittent fever met with in Southern latitudes may call for a different management. [My own experience has convinced me that it does not. It should not be selected, even as a purgative in the case of the Confederate soldier.] But the excellent reports of Dr. Bolling, and several other Southern physicians, render this supposition improbable. Moreover, if we turn to the East Indies, whence the calomel treatment first emanated, we shall find that it no longer holds its original place in the medical creed of that country. One of the most eminent of the East Indian practitioners, Dr. Charles Morehead, says:† 'The practice, at one time too common, of exhibiting calomel in doses of four or five grains three or four times in the course of the day, without any very definite object in view, and continuing it for a succession of days, cannot be too strongly discouraged.

†Clinical Researches on Diseases in India, i., pp. 202-205.
Not only is it unnecessary, but for the following reasons, often positively injurious. In watching the progress of cases thus treated, it is not difficult to detect a train of symptoms much more fairly attributable to the treatment than to the disease, because it is in cases thus treated that this has been chiefly observed. The symptoms to which I allude are uneasy feeling, sometimes amounting to pain, with a sense of oppression or sinking at the epigastrium, and occasionally gripping of the abdomen, for which leeches are not unfrequently applied, and purgatives unnecessarily given. The frequent repetition of the calomel keeps up also a foul state of the tongue, nausea and irritability of stomach, aggravates the febrile excitement, and produces an irritable state of the bowels, marked by frequent watery discharges. The convalescence of cases thus treated is always tedious, and frequently complicated with diarrhœa and clay-colored dejections. 'I am of opinion that an endeavor to induce mercurial influence in remittent fever is erroneous in theory, and of no value in practice; not only so, but 'it is opposed to all rational theory, and very injurious in practice. If it be true that prostration of vital actions and a deteriorated condition of the blood are pathological states to be much dreaded in remittent fever, and if mercury deteriorates the blood and favors prostration, on what principle of reasoning can it be supposed that induced mercurial influence can have any other than an injurious effect on remittent fever?' The author further attributes to the mercurial treatment so long prevalent in that country, the frequent occurrence of a cachexia marked by asthma, dyspepsia, injured teeth, pains in the side and loins, foul tongue, constipation, pale faces, and depressed spirits."

From my experience in the Marine Hospital, where a large number of the worst forms of malarial fever were treated, with a very large proportion of recoveries (see
Porcher's Suggestions.

report in detail, Charleston Medical Journal), I ascertained that, with the exception of an occasional dose, mercury could be dispensed with. A few grains were given at the inception of some cases, and occasionally, in combination with a little Dover's powder, was administered at night to others in whom there was not much prostration. Few or none of the cases of bilious remittent fever, even of the severest grade, require more than ten grains during the whole course of the attack.

There is no objection to using two grains of calomel with two or three of Dover's powder occasionally, in cases of typhoid fever or typhoid pneumonia with dry tongue; and it has an excellent effect when given simultaneously with brandy or turpentine, one or both, and chlorate of potash water as a drink. These, with nourishment and revulsives (and cupping and poultices if the case demands them) are pretty much all that are required, where we conclude not to treat the diseases with veratrum viride. By giving mercury thus, in combination with Dover's powder at distant intervals when necessary, we avoid its injurious effects. The stimulant will be found still farther to neutralize and counteract any ill effects of the medicine, besides being itself specially serviceable in improving digestion and preventing depression of the nervous centres. This employment of stimulants simultaneously with mercury I have found an important point in practice.

I have also seen excellent results recently from a combination of Dover's powder, three or four grains with three of antimonial powder and one half of calomel, as an alterative, expectorant, and diaphoretic in pneumonia and to prevent the approach of hepatization of the lungs.

Turpentine also, which is so extensively used, need never be given in doses larger than five to ten drops repeated. It will sufficiently stimulate the intestinal
mucous membranes in this quantity; and with an occasional mercurial and wine or brandy, will produce all we expect of it in acting upon the mucus surfaces, in preventing depression of the nervous centres indicated by dry tongue, delirium, etc.

I have established three or four rules which, in my opinion, may be regarded as general principles in medicine, which I will state before passing to other matters:

1st. The natural tendency of disease is to recovery in all fair cases when judiciously treated, not improperly interfered with, and suitably nourished and supplied—the hygeinic conditions being also favorable. Bad treatment, with defective management, will destroy even these.

2d. When the tongue continues dry, alcoholic stimulants can and must be used repeatedly and freely till it becomes moist, because it indicates want of glandular and secretory action, caused by depression of the nervous centres. The quick pulse is simply owing to the altered condition of the blood and the defective innervation, and stimulants are not contra-indicated. To administer purgatives or mercury merely because the tongue continues furred, is ruinous.

3d. At the inception, or even in advance of delirium, apply blisters to the back of the neck and upper portion of the spinal column. The stimulants may also be continued.

4th. Alkalies are serviceable in the inceptive and early stages of disease; acids after the inflammatory symptoms are subdued and the climax is passed—or during the decline of the disease following the protracted use of depletive and active medicines. Acids with tonics are universally applicable when the stage of excitement has been subdued by active medication, and there is relaxation, weakness and prostration, and excessive drain from any cause.
I would also inculcate upon the junior members of the profession (as the result of my own experience repeatedly acquired from experiments made with a view to testing the question of its safety) that, when pushing any course of treatment—but particularly one whose possible tendency is to produce irritation or diarrhoea—it is best to check the treatment, or to desist from it, even before its full beneficial results appear to ensue. Let them invariably err on the side of abstinence, and thus give nature time to operate—her own most excelling handiwork. They will seldom, if ever, regret the "hands off" system.

It has often happened to the writer whilst carrying out a cautious, non-purturbative course of treatment, as above indicated, to question the policy of prolonging it—to fear that the diseased condition, a hepatization of the lung for example, would be re-established, or an inflammation be relit for want of more active measures. I have always found that a favorable result followed the cessation of treatment at the earliest possible moment—earlier than many would have supposed judicious, particularly when aided by external revulsives, demulcents, salines, sponging with cold water, etc.

Merely to extol the recuperative powers of Nature and satisfy ourselves with the trite quotation "vis medicatrix," etc., is useless. Let us do what is better: believe in her practically, give her a fair chance to assist in the cure before organic changes have taken place, and the powers of life are fatally compromised.

Among the general suggestions that I would respectfully offer, are the following:

If to superior judgment, skill and experience possessed by one physician over another, there be added one habit to be cultivated for its real practical effect in promoting recovery, it is that of encouraging the sick. Let it be no idle mannerism put on or assumed for effect. It is a
“third estate” in physic, and is next in importance only to food and medicines. It is absolutely potent in its plain, positive results, for the sick man, in his weakened state with his nerves unstrung, is a prey to his diseased imaginations, and depression of spirits greatly diminishes the recuperative energies of the entire organism. He has the “mens insana, in corpore insano.” The fancy prone to despondency, and inclined to look at the dark side of things, has dethroned the judgment; and it is the business of the surgeon to reinstate hope and cheerfulness in his heart, on account of the influences which he knows they have upon the vital functions, the secretions, the appetite, and consequently the power with which he responds to remedial agents. By a pious fraud, if necessary, he should conceal from his patient all useless knowledge respecting his pulse, tongue, amount of fever, criticalness of condition, so long as the concealment will tend to lift him out of his state of gloom, despondency, or apathy, and will inspire him with anticipations of recovery. The beneficial effects of instilling cheerfulness and hopefulness cannot be overestimated, and the sufferer should never be left without some encouraging word. We have all witnessed the sudden and extraordinary revolution produced, even in the desperately sick or wounded, by the anticipation of a furlough and the hope of revisiting their homes. Revived hope, as with the wand of an Enchanter, kindles new life in the worn-out frame.

From the brief and imperfect description I gave of the depressing and exhausting effects produced by the circumstances which surround the Confederate soldier, this course of conduct becomes of the first importance in reference to him.

The “Pathology of Shakespeare,” as the learned, comprehensive and elegant Watson has called it, when he
Porcher's Suggestions.

1866.

speaks of "rasing out the written troubles of the brain," and "ministering to the mind diseased," may therefore be observed by the surgeon with the greatest advantage. Superadded to the prostration and general asthenic state which I have asserted to be the dominant feature of our sick soldiers, there is also very generally extreme apathy as to results, however sombre may be their complexion, or even fatal to their hopes, wishes, or lives.

The Confederate soldier resigns himself to his fate. Once that it is decided that a return home is impossible for him, and he must remain in hospital, the physiognomy of his condition is admirably expressed by the Italian phrase poco curante, which he carries in every feature of his face, in his gait, and in his bearing. He really seems to present the unusual spectacle of a man devoid of either hopes or aspirations; or if he has them, they are suppressed. When he entered the service, whether from compulsion, or, as in nearly every instance, urged by a noble patriotism, his mind was prepared for any fate; the scenes of danger, also, through which he has passed have strung his nerves to so high a pitch of tension—so much higher than mere sickness, which is far below the battle-field in the stirring intensity or the elevation of the emotions it excites—that he is not impressed by his present peril, however imminent may be the fate which it threatens. He is therefore languid, careless and indifferent, and his mind needs to be aroused and stimulated.

There is no one so uncomplaining as the Confederate soldier. Every surgeon who has seen active service will confirm the truthfulness and accuracy of a picture drawn without exaggeration. In your daily rounds to offer him relief he gazes upon you, but does not complain that you pass him by, asks for nothing, does not bemoan his fate, nor murmur at the insufficiency of either food or attendance. He may lie sick under a broiling sun, in a heated
tent, or wounded; he may languish in a hospital, amid the dying and the dead, surrounded by everything to appal even well men:

"Ubique luctus, ubique pavor
Et plurima mortis imago."

Yet the mere stripling possesses his soul unterrified, and utters neither cry nor groan. There has always been a courage, and a resolution mingled with his apparent indifference, which has extorted my admiration, and has compelled me involuntarily to recall the noble description of the invincible Cato, whose unsubdued spirit soared aloft when the world crumbled at his feet:

"Omne terrarum subacta,
Preter atrocem animum catonis."

In this display of his courage, there is an inexorable sternness almost amounting to atrocity.

When the soldier, leaving friends, kindred and home, delivers up his life for his country, he has paid the dearest tribute that man can offer, and there is a moral sublimity in the act which ennobles the very poorest. In every age the sacrifice has been immortalized in verse and song, and the divine Dante says of him:

"He goes in quest of Liberty—which is so costly—
As he knows best who suffered default of life for it."*

I have always thought that the Roman maxim obsta principiis, expressed very finely the proper policy to be pursued by the physician and surgeon in the treatment of diseases or surgical injuries. Among the practical suggestions of a general nature, I wish to give prominence to it, as embodying a useful principle: for many surgeons lose time and worry themselves, or become discouraged; because they fail to manage successfully those who are beyond the reach of art. Early treatment should be

* "Liberta va cercando, ch'e si cara,
Come sa chi per lei vita rifiuta."—Purgatorio, i., p. 71.
regarded as almost a *sine qua non* to success. In other words, lose no time at the beginning of diseases, or as soon as they are presented for treatment. Then you can arrest more easily and completely the spread of symptoms; for the danger of organic changes, of blood-poisoning, of passive congestions, of secondary accumulations, of depression of the nervous centres with its results, increase in a geometrical ratio the longer they are permitted to remain unchecked. The surgeon should never permit a hot, burning fever to continue, if it be possible to prevent it by remedial agents, sedatives, cooling applications, etc., for when the passive congestion, coma, or delirium follows, it is too late. Let it be remembered that medicines are far more potent in preventing or arresting diseased states than in curing them when fully developed, and it is especially difficult to do away with the ill-effects of the secondary results of disease. After surgical injuries, use cold water at the beginning and continue it *uninterruptedly*, and do not wait till the inflammation has run too high, or an hour even is lost. Do not strive so much to recover a patient after an engorgement or a hepatization of the lung as to prevent them. Anticipate these changes by energetic means employed at the beginning. It is an easy matter to check the cholerine ushering in an attack of Asiatic cholera, but very hard to arrest the disease after it is fully declared; and this is true with respect to almost every ailment to which the human frame is liable.

In diphtheria, which is a blood disease with the characteristic ashen appearance of the throat, fauces and nasal passages, it is necessary to *begin* the treatment with muriated tincture of iron, chlorate of potash, local applications, soft-boiled eggs, or other light and nutritious food, brandy, etc., at the very earliest possible moment. A few hours delay will make all the difference as to the final
result. Recent contributors speak of cerebro-spinal meningitis as a disease which is inevitably fatal. The only hope will, in my opinion, be found in full blood-letting at the very inception of the disease, when the malaise is exhibited. This, with blisters to the neck and spine, cold affusion to the scalp, veratrum viride, and possibly mercury, in small doses repeated, may, if used early, arrest and prevent the secondary blood charges by lowering the inflammatory action. Surgeon Miller informs me that he has thus employed blood-letting successfully. Nearly all recent writers recommend quinine and opium.

After surgical injuries, cold water by irrigation, or continuously applied, should not be delayed an hour after any danger from the shock is over. It must be applied thoroughly or not at all. In a large hospital with a number of wounded, I have used dried gourds or squashes to hold the water; they have not a very scientific appearance, but they are light and easily suspended, and they can be refilled without trouble. Empty tin cans will also be found very convenient.

A course of treatment which has been found to be generally successful when employed at the inception of a disease, should not be abandoned by the surgeon because it fails to relieve those who are beyond the reach of assistance from any remedies. Watch the patient closely when he enters, and before he becomes too sick; and give explicit and full directions, with a view to prevent the morbid changes that the surgeon knows are those that will ensue. This is all resolved into the common household maxim: that an ounce of prevention is worth a pound of cure.

If the case is plainly one in which fatal organic changes may have already occurred, do not attempt to combat them by active medicines. The only hope is in the mildest alteratives (and these are of doubtful utility),
rather trusting to the powers of nature, aided by the use of the oxygen-bearing bodies, stimulants and revulsives. Tartar emetic, calomel, etc., are not only ineffectual, but they tend to impair whatever recuperative force still remains. All terrific exertions over the concluding scenes (attended by a great waste of whiskey) are out of place, though very common.

There should be much more attention paid by the surgeons, with such rich opportunities open to them, to perfecting themselves in the art of auscultation and percussion, as well as in the examinations of the renal secretions, in order to assist in the more rapid and accurate diagnosis of some of the most important and numerous cases that come before them. The study and practice of auscultation is to them more than ever a necessity.

It would be well, perhaps, that those known to be skilled in it should be distributed as consulting surgeons wherever soldiers are collected in any number, with authority to aid by daily visits those who stand in need of assistance. One specially qualified by his knowledge of auscultation, or any other branch of diagnosis, should if possible be a member of every Examining Board; and to this extent in their formation the military rule regarding mere rank, age, or date of commission should be violated. It is useless to say that it is expected or assumed that all surgeons should be skilled in every branch of physic, and competent to the performance of every duty required at their hands.

It is well known that surgeons practice for the most part, so far as reading is concerned, upon the capital stock acquired before the commencement of the war. The remark is not made in a derogatory spirit, for the excitement, change to which they are subjected, want of books, etc., are natural reasons why any prolonged application to study is rather the exception than the rule. Many of
the most competent men, whether by reason of age, experience or attainments, were assigned to duty or accepted seats in high cathedral places, on boards, as medical directors, inspectors, purveyors, etc., instead of being placed in active service, where their practical and previously acquired knowledge, or their manual dexterity as surgeons, might have at once contributed to save the lives of thousands who have been treated by the junior and more inexperienced members.

But a transposition is fast being effected: for the juniors in years, from being always in the front, in the field, in the hospitals, or in some position of active responsibility, have become the seniors by the practical experience and the skill which they have acquired.

Every surgeon or assistant surgeon, who is competent, should make it his business to examine each patient at least once attentively and thoroughly. This should involve his previous history and the separate interrogation of every prominent organ implicated in the diseased condition. No pains should be spared, for though in the end we may only attain to an approximation to a knowledge of the pathological states, yet this is far better than mere guess work. By the use of all the means at our disposal, through the instrumentality of the superior implements of diagnosis, including the microscope, chemical reagents, etc., greater accuracy is secured than by a mere casual inspection. Superficial or hurried examinations lead to erronious conclusions, and the omission to perform them properly is an act of injustice to the sick. Let every one witness the difference between a complete and thorough examination by an expert, and the careless, hurried, superficial observation of one ignorant of his business, and the proof of its importance will be too convincing to be denied.

For this reason, assistant surgeons should not hurry
through their work. They should esteem their position a privilege, and be glad to avail themselves of the opportunity for instruction, if not for the benefit of the sick, at least for their own improvement. They are rewarded for their services, and no private reasons or motives of self ease should deter them from a full and faithful attention to them without haste, which is inexcusable. They should devote themselves specially to the very sick, and not be contented with two or three visits a day, as if this was a matter of rule, or as if they were members of a “square and compass club.”

It has frequently struck the writer that everywhere in the army the claims of relationship, or private friendship, should be more studiously ignored. In a military service, where all should equally endure the privations and sufferings incident to a war for independence and for national life, there should be no preferences, no partialities of any kind, based on previous personal connections, extended to one individual over another, whatever may be his rank, title, or patronage. Every hardship should be equally endured; no greater favor should be granted to the most influential than to the humblest private soldier. They should stand upon precisely the same footing in any decision that is made respecting them.

With the power of exempting the sick from duty, allowing him to remain in private quarters and granting him a thousand privileges and advantages, the surgeon should always endeavor to exercise the right with a strict view to general equity founded solely upon the merits of each case. No influences whatever, save these, should control his actions. These principles are so closely allied with integrity and true patriotism that the caution might, with propriety, be dispensed with; but personal claims are sometimes so hard to resist, and the practice of yielding to them is so injurious to the general welfare,
that the writer need not claim indulgence for even alluding to the necessity for their being rigidly observed.

Before closing this portion of my remarks, I beg leave to make one observation to those officers who hold supplies in their hands, and upon whom the surgeon mainly depends for furnishing and supporting the sick.

Quartermasters, commissaries, medical purveyors, medical directors, senior surgeons of posts, surgeons themselves, and I may add, paymasters, should remember that the chief virtue does not consist so much in the collection and hoarding of the greatest amount of stores as in their proper, prompt, and equitable distribution, under suitable restrictions, to those who require them. And yet how few approached "the height of this great argument." They cling to their stores as if they were a part of themselves, carefully preserve them at points remote from battle-fields or beleaguered cities, and will rather see them burned than used. There is no virtue in mere storage, per se. The virtue consists in its judicious distribution, for such is the only object of the accumulation. The sick and wounded sometimes perish for want of articles within their reach which are simply hoarded. This is done from a failure to appreciate the true philosophy of the matter, coupled with a certain amount of indifference and "circumlocution." The supplies are so difficult to get at that for all practical purposes they may as well not exist. It "goes without saying," however, that some collection is necessary, or else there would be nothing to distribute.

For stewards, matrons, attendants, and others in hospitals to pamper and indulge themselves in waste and high living, while those in the trenches have only the plainest fare, is, to say the very least of it, indecorous, though sometimes regarded by those who enjoy to the full the benefit of their position with feelings of pride and full
satisfaction as if they were superior because they provided well for themselves. The surgeon should, under such circumstances, rigorously enforce sumptuary regulations and restrain within proper bounds those who, mistaking the true relation of things, entertain themselves with more than is their due share. There is not the slightest reason why such disparity should be allowed to exist and that all the advantage should lie on the side of those who are certainly not more deserving of them. Let the chief aim and motive of all be to minister to the wants of, even to indulge, the sick—the well will generally take care of themselves. The inequalities which have pervaded our armies in these respects are glaring and require to be corrected. Inspectors of the highest character of the antique Roman type, who will not swerve a hair's breadth from their duty, could be employed with the greatest advantage to examine into the "inner life" of commissary, quartermaster, medical, and other departments. But, alas! unless such are selected, the satirist is likely to inquire, quis custo diet ipsos custodes!

I now invite attention to two or three diseases to which the principles laid down are specially applicable, and which have attracted my critical attention on account of their importance.

There is nothing so common, so universally prevalent, and so fatal in its effects upon the Confederate soldier as chronic diarrhoea, particularly during the Spring and Summer months. This is the great scourge of our armies; it coexists with almost every other disease with which he becomes affected, and the best mode of managing it is consequently of interest to us all. It may or may not be, but often is, associated with a certain amount of dysentery, and sometimes chronic dysentery is almost as frequently met with as diarrhoea.
I would banish from the treatment of either that almost universal recourse of every surgeon, acetate of lead and opium. It is true that mineral astringents check the discharges temporarily, and there is often an apparent benefit following their use, but the relief is only fugitive. They are injurious to the Confederate soldier in his impoverished, prostrated condition, inasmuch as he depends upon the integrity of the gastro-intestinal surfaces being preserved for the purpose of assimilating food as soon as possible, in order to maintain a fair balance in his favor in the unequal strife between life and death. The illustration is very common-place, but not less true, that it is a question of plus and minus, and that he has of necessity, whilst the disease is being checked by mild astringents, to receive into his exhausted system enough nourishment to counterbalance the drainage going on. He must absorb and assimilate more than he loses, or he dies.

In the length to which this paper is limited, I cannot enter minutely upon the mode of action of medicines, but with reference to mineral astringents it may be briefly stated: that they act directly upon the mucus membranes by entering into combination with the albumen of the tissues, thus materially interfering with their integrity, disturbing the functions of absorption, and consequently of digestion, which is of such prime importance, in this respect differing in degree, if not essentially, from the vegetable astringents. In the Confederate soldier, weakened and exhausted as he is by his previous life, by exposure and the circumstances which surround him, we cannot afford still farther to impair his recuperative energies by any but those agents which will barely suffice to constringe the relaxed membranes and to gradually diminish the discharges with the least possible injury to the subsequent absorption of enough food to nourish and sustain him.
Of the agents of this class, *vegetable* astringents, chalk mixtures, with demulcents, milk, eggs, arrow-root jelly, with small quantities of brandy or other stimulants, are all that he can have. He must be trusted to time, rest, the recumbent posture, to the recuperative powers of his constitution and to nature.

I have been in the habit of using a tea made of the root of the blackberry, which possesses the advantage that it can be easily obtained in the vicinage of any camp, infirmary, or hospital. The decoction made with an ounce or two of the root in a quart of water boiled down to a pint, may be given in wine-glassful doses, with a little brandy or whiskey added, several times a day. Two grains of Dover's powders, with half a grain of calomel, may be prescribed at night. This, or some similar harmless treatment, should be continued, pro re nata, and be the only one used, with the simultaneous introduction of suitable and easily-digested food in quantities that will be retained and not prove hurtful. Its applicability consists in its mildness. There should be no castor oil, no purgatives, no continual alteratives, repeatedly employed, for they fatally impair the digestive functions, which are absolutely essential to recovery.

In lieu of the decoction of the blackberry-root or the bark of the sweet gum (*Liquidambar styrraciflua*), which is both astringent and balsamic in its properties, I have frequently advised and used largely, with the best effects, an extemporaneous "chalk mixture," which possesses the important qualities of being an absorbent, an astringent, and doing as little harm as any medicine can be divested of. It is prepared thus: Prepared chalk, one drachm; Tinct. opium, two drachms; Paregoric, one drachm; Tinct. of kino or catechu, two drachms; Water, six ounces; a desert-spoonful after each operation.
Some surgeons inform me that they find Hope's mixture beneficial, and others use a demulcent preparation, with a little turpentine added. The latter is serviceable where there is a tendency to dry tongue and distension.

My reasons for combining with two or three grains of Dover's powders at night a small quantity of calomel is, that I have considered the condition of the internal organs in (chronic) diarrhœa somewhat analogous to the diarrhœa of teething children, where the secretory functions of the liver and the glandular system are impaired, and where mercury and Dover's powders, in minute doses, with vegetable astringents, change of air, and proper food are now universally recognized as being essential and the only treatment. Opium alone, or with astringents, are ineffectual.

Assistant Surgeon Frierson informs me that in the hospital in which he was employed, under Surgeon Selden, where convalescents from protracted cases were generally brought, they found great advantage following the use of extract of nux vomica. The reasons of this are obvious, viz.: the loss of the accustomed tonicity in the organs requiring a nervous stimulant. It is equally useful in the opposite condition of constipation when dependent upon the same cause. In very violent and protracted cases accompanied with dysentery, and resisting all other treatment, I must admit that I have seen beneficial effects ensue after the use of nitrate of silver with local applications.

Surgeon Fauntleroi, in charge of the hospital, second division, Danville, Va., relies in such cases upon two or three grains at a dose, and he cautions us against the addition of opium, which confines its action too high up in the digestive track.

It has been my plan also to apply blisters occasionally on the left hypogastric and hypochondriac spaces, over
the descending colon. It is, of course, difficult to decide to which particular agent used we are to ascribe most good effects, but I use blisters invariably where there is any dysentery present, for obvious reasons; and the point mentioned is selected because the pain and inflammation is generally found in that locality. They should not be large and exhausting, and should be followed by poultices assiduously applied.

In the treatment of dysentery in the army, it is necessary to use the same caution with respect to active medication. So necessary do I consider this, that as much confidence as I place, after repeated trials, in the salts and laudanum mixture (Epsom salts, two ounces; Laudanum, two drachms; Water, a quart; two tablespoonfuls after each operation, till the blood is checked), or that made with cream of tartar and Dover's powders (Cream tartar, two ounces; Water, a quart: a wine-glassful, with four grains of Dover's powders, every four hours), yet I have scarcely even thought these prescriptions warranted in the reduced condition to which most of our soldiers are brought before entering a hospital. So that in this disease I have been compelled to trust to occasional doses of Dover's powder, two grains; calomel, half a grain; given at night, for some mercury is very beneficial, particularly in cases of dysentery depending upon, or connected with, hepatic enjoyment, and consequent reflux upon the mesenteric and hemorrhoidal veins. Dover's powder, in three-grain doses, may be given during the day, and chalk mixture and vegetable astringents so soon as the inflammatory symptoms are in the slightest degree subdued. This treatment can indeed be used at almost any stage of the disease, employing blisters, followed by repeated fomentations or poultices, and giving light food, with milk, rice, arrow-root, etc. Bitter tonics and stimulants may be introduced at the
earliest possible moment, or simultaneously with the course above mentioned. In other words, employ a mild, tentative, soothing treatment, with an avoidance of anything active or calculated to irritate or arrest still farther the digestive and assimilatory functions. In most diseases the general management of the case, with the application of a combination of means, external and internal, to secure certain ends, is more effectual than the use of any particular remedy, though there is great room for selection in these also.

I do not consider these directions as particularly novel—their chief merit, if they have any, is the general direction to which they tend, which will be found more salutary than an opposite one. The surgeon must be cautioned against a perturbative system, which is essentially fatal and destructive, from the nature of the cases which he has to treat.

Not merely for their utility during convalescence from the diseases just mentioned, but for their general benefit, there should be in daily use in all hospitals some vegetable bitter tincture. The compound from the formula in the Surgeon-General's office, known as Moore's tincture, or any preparation or infusion of the bitter barks, wild cherry, willow, dogwood, poplar, one or more mixed with a sufficient amount of whiskey to preserve it and add to its efficacy, should be made in large quantities and daily used in all hospitals, infirmaries, or camps. It must not be left to the assistant surgeons to order their preparation at each time that they are wanted.

The thoroughwort plant, boneset (eupatorium), should also be collected and kept in large amount in the apothecary establishments attached to hospitals, in order that the use of such simple and excellent preparations may be facilitated. These, used as substitutes for mineral medicines, will prove highly beneficial to the service. This is
owing also to their intrinsic values in giving tone to the system, increasing the appetite, or producing vomiting and diaphoresis, laying aside any anti-periodic power they may possess. These varying effects, as in the example of the boneset, depend upon the form in which they are administered, viz: whether cold, tepid, or hot.

Gerhard, in his lectures on the diseases of the chest, recommends very highly both the eupatorium and senega, in decoction, in pneumonia and bronchitis, with the addition occasionally of sanguinaria. I have repeatedly used them, and with great advantage. The employment likewise of neutral mixture, chlorate of potash, effervescing draughts, or other cooling agents, is highly beneficial in a hospital, as they take the place of substances that are of doubtful utility and more dangerous, or less innocuous, in their effects upon the class of patients the army surgeon is called upon to treat.

In the declared pneumonia and bronchitis following measles, for example, it is far preferable to trust to a drink of chlorate of potash water (three drachms to a pint), and the mildest alteratives of calomel and Dover's powder, or morphia, a fourth to a sixth of a grain each, with an anodyne diaphoretic at night; if there is much perspiration, to quinine and aromatic sulphuric acid, and to nourishment, and the healing influences of time, than to attempt to jugulate the disease by any active treatment.

Prof. Chambers, of London, in a recent paper on the treatment of pneumonia by cupping and jacket poultices, to the exclusion of mercury and tartar emetic, republished in the Confederate States' Medical Journal, sustains an opinion I have long and openly maintained as the result of my own experience: that a case of pneumonia never improves so long as there is running off at the bowels. This is absolutely fatal in the disease of the chest consequent upon measles, unless speedily checked. The
tendency to it should be anticipated by opiates and stimulants.

Army surgeons, now-a-days, profess to cure sloughing wounds, gangrene, etc., with the greatest facility with nitric acid, mur. tinct. of iron, and so forth. Some employ poultices. Guthrie (and those following in his wake), condemns the latter out and out, in a wholesale way, with most opprobrious epithets: "cover sluts" and such like terms. One would suppose that Astley Cooper, Liston, Dupuytren, and the great army of able men of a past day, were either mere children, or had been practicing the most egregious errors during their whole lives.

After witnessing a large number of sloughing wounds following the battles around Petersburg, but no gangrene, as this was prevented by securing-tents at all hazards, and disgorging the wards into them, I have endeavored to come to some conclusion as to the relative merits of the agents tested. I find that some things are required besides nitric acid, and that poultices are of the very greatest service when judiciously applied—not only in sloughing wounds, but wherever the inflammatory action is too high, or when we wish to determine to the surface, as in cases of deep-seated matter or abscess. But surely one would hardly be compelled to argue in favor of the utility of any description of poultice in hastening the maturation of a boil or whitlow, in soothing the pain, or bringing matter to the surface. Cold water is applicable and essential at a period when poultices are not, and vice versa. There is no substitute for either. I would not speak dictatorially when I say, in the first place, that in a sloughing wound where there is a large amount of dead matter, sometimes an inch or two thick, concealing the sensitive parts beneath, which you wish your stimulant or escharotic to reach and excite the granulations of, that
it hastens the process extraordinarily to use a pair of scissors and cut it away outright. When you do this (and I have repeatedly seen it save life), whilst giving muriated tincture of iron, quinine, or other stimulating tonics internally, you expose the sensitive layer supplied by blood vessels, and then even nitric acid is hardly needed; for any stimulant, turpentine, alum, sulphate of zinc, muriated tincture of iron, yellow wash, is sufficient to excite the parts to healthy action. Before the use of the scissors, nitric acid, or the "fuming nordhausen" itself are hardly sufficient to act upon the dead inorganic matter, and time is lost.

A charcoal or yeast poultice is often also of the greatest service in hastening the disengagement of the slough, but particularly also in lessening the inflammatory action, which often runs too high, and is the cause of the extension of the sloughing process. In any wound, sloughing or not, where there is too great heat, redness, and inflammation, the greatest benefit is derived from the application of soothing poultices of any description; but particularly from those possessing the antiseptic and absorbent properties mentioned above. This statement I have demonstrated almost daily. Doubtless poultices of any kind can be used too much. I have seen surgeons continue them quite too long. After wounds, after amputations, when the tissues are pale and relaxed, and there is an absence of too great inflammatory action (which is always destructive), poultices are injurious. When employed too constantly, they are often the cause of the flabby, relaxed condition which prevents healthy granulations, arrests the healing process, and produces wasting discharges. The question of their applicability or not is one easily decided.

Nitric acid or other active stimulants, as all admit, are very serviceable in gangrene, with internal tonics which
constringe the cappillaries, employing also highly nutritious food.

I introduced into daily use at the South Carolina hospital, Petersburg, where several hundred wounded men were collected, an agent which is an admirable substitute for Labaraque's wash, Darby's fluid, or other disinfectant or antiseptic preparation. It is a weak solution of commercial copperas in water, which for local application to stumps, sloughing wounds, fetid ulcers, etc., may be made by the gallon. It is a very efficient antiseptic and disinfectant, also a good local stimulant and astringent, and it has been long used in erysipelas; its cheapness, likewise, commends it to the surgeon during the present exigency. My employment of it before the war, in the marine hospital, Charleston, as a general disinfectant for yards, suggested the extension of its use to the wards and for the wounded.

In concluding these somewhat desultory remarks, I cannot but suppose that others may differ from me; but I am fully convinced that the foregoing views are correct in the main, having been found successful as far as my observation extends, and after a good deal of careful attention to the subjects referred to.

ARTICLE IX.

Gunshot Wound of the Spinal Cord, and the ball found in the ascending Aorta. Patient lived ten days. By DeSaussure Ford, M. D., Demonstrator of Anatomy in Medical College of Georgia.

Mr. A., of South Carolina, thirty-eight years of age, of full habit, in vigorous health, weighing one hundred and eighty pounds, was shot on the 26th of May, 1866, and I saw him, in consultation with Drs. Smith and Brooker, the 28th, at 11 o'clock a. m. He was standing twenty-
five feet from, and rather obliquely, with his back presenting to a store, from which he was shot, the ball passing through a pane of glass. He was suddenly thrown down, there being instantaneous paralysis and anaesthesia of the inferior extremities. The pistol supposed to have been used, was the largest size Navy Colt's, carrying a conical ball.

The ball entered to the left of the spinal column, opposite the fifth and sixth dorsal vertebrae. The wound had been repeatedly probed, but notwithstanding this, and my aversion to probing wounds often, I used a large size bullet probe, cautiously, which passed two inches deep, obliquely downward, and almost parallel with, but ranging toward the spinal column. I failed to discover any fracture of the vertebrae or ribs. He complained of so much pain in the left side, over the region of the heart, that I examined carefully, by physical exploration, the thoracic viscera, but nothing was discovered which indicated any disturbance of these organs. His breathing was somewhat labored, but the pulse natural and soft, beating eighty-five, the skin pleasant and warm, tongue coated heavily with a white fur, and hiccough, his spirits low, and countenance very anxious. He had been catheterized twice daily, but the bowels had not acted since the accident, although enemata had been administered repeatedly. He was seen by one of the attending physicians five minutes after he was wounded, who represents that "his suffering was intense; was much prostrated; considerable hemorrhage, say twenty ounces during the first six or eight hours, after which it subsided, and reaction in six or eight hours; constant pain in the chest; great thirst."

In the consultation, I gave the opinion that the probe failing to reach the bones of the spinal column in any of the probings, the absence of any tenderness of the spine
proximate to the wound, with the absence also of crepitus, and the paralysed parts having remained perfectly warm and pleasant, with no increased warmth or coldness, neither clamminess, and the pulse natural, that the ball had probably embedded itself somewhere in the muscles of the back; that the cord had not been injured, and that the paralysis was the result of concussion, rather than either compression or laceration of the spinal cord, or its membranes. We determined to treat the case by repeating enemeta, small doses of sulphate of morphia, and perfect quiet.

He rested quietly until the next morning, when the enemeta failing to bring a discharge, a half ounce of castor oil and ten drops of spirits of turpentine were administered; before this had time for effect, he had a copious faecal evacuation, but was not sensible of it. The oil and turpentine commencing to act, he was rendered so feeble that whiskey punch was administered freely. The night of the 29th he rested quietly, and manifested more comfort and cheerfulness. The pulse, during my stay of two days, was natural, ranging from eighty to ninety, except immediately after the large evacuations from his bowels. The only uneasiness manifested was the constant pain over the region of the heart, with occasional hiccough, which was sometimes violent, but draughts of solution of bicarb. of soda relieved him temporarily; during these paroxysms of hiccough, he complained of excessive oppression over the sternum, and begged to be pressed forcibly at that point for relief.

My father, Prof. L. D. Ford, saw him for me the next day, remaining with him the whole of it, observing only this pain, the hiccough, and spasm of the diaphragm. The bladder was still relieved by the catheter; his condition was considered favorable; was taking nourishment freely, and talking cheerfully. The sensibility of the
paralysed parts was estimated by his attendants to be returning. My father saw him again on the 1st of June, finding him in a comfortable condition, cheerful, pulse natural, appetite good, and although the hiccup still annoying, the prognosis was favorable.

By advices from his attending physicians, he was represented as doing well, when we were summoned to him on the 5th of June, a hemorrhage from the wound occurring on the night before. The bleeding came from the vessels of the spinal column. He was found cold, pulseless, his mind wandering, in which condition he remained until 9 o'clock of this day, when he died.

Post mortem examination was performed by Drs. Smith and Brooker, my father being present, the morning after death, before the coroner and his jury, and under other circumstances not favorable for a critical examination.

The subject upon his face, an incision was made across the wound, down to the vertebral column, and the track of the ball discovered, which passed through the base of the transverse process of the sixth dorsal vertebra, and thence into its body, wounding the membranes of and the spinal cord. To determine the further course of the ball, a section of the vertebral column was removed, including vertebrae below and above the wounded one, separating this section from the aorta from above downward. It was found that the ball passed through the body of the vertebra, leaving some spiculae of bone in contact with the membranes of the spinal cord. This section of the column was then laid aside, and no course or track of the ball was perceptible. The viscera within the thorax were examined by free feeling; the ball not felt, the opening in the posterior part of the thorax was enlarged, by sawing off more of the ribs, and the viscera removed, by dividing the aosophagus and trachea, and the vessels at the top of the chest, and the pericardium cut through
in detaching these viscera from the diaphragm. This disadvantageous mode of removal necessarily caused much mutilation of the viscera; thus the pericardium was necessarily opened, and some incisions made into the heart itself at its apex. The lungs were crepitant throughout. In examining the heart, the ball was felt in the ascending aorta, which was taken out by making an incision into the vessel; the base of the ball was unaltered, but the apex was rough and jagged. The cavities of the heart were opened, and a coagulum, ante mortem, was found in the left ventricle, extending toward the aorta. The inner surfaces of the ascending aorta and its arch were of an intense, deep vermillion color, which extended throughout the entire substance of the arterial coats, and this remarkable pathological appearance was also found in the arteria innominata, but left subclavian and carotid arteries were natural in color. This color was also present in the descending aorta, gradually diminishing in intensity, and confined to the internal coat.

At the base of the left ventricle, at the junction of the pericardium with the aorta, there was an irregular opening in the external tissues, and in the aorta corresponding there was a slit of sufficient length to allow the passage of the ball.

The upper portion of the heart, including the auricles and parts of the large vessels leading from the organ, was brought to the city for more careful inspection. With the assistance of my friends Professor Dugas and Joseph Jones, it has been determined that the ball entered this irregular opening, of a circular form, which was in the posterior portion of the ascending aorta immediately beyond the semi-lunar valves, corresponding to the point where the ball was found; the external tissues about this opening were bruised, the edges of it lacerated, and looking inward, while the elastic coat had the appearance
of having been incised, which must necessarily be the case in wounds by balls of the elastic coats of large arteries, the rent being in the direction of the fibres.

It is to be noted here as an important feature in this case, the remarkable vermillion color of the aorta and arteria innominata, indicating that this ball, probably, at each contraction of the left ventricle was thrown forward in the ascending aorta, by the advancing column of blood, up toward the arch, which it did not pass, and by the elastic reaction of the aorta, was then thrown back upon the closed semi-lunar valves, and that here this ball was dancing during the life of the patient, being a continual source of irritation. Why the intense color was not found in the left subclavian and carotid vessels I cannot conjecture. This remarkable pathological condition about the point where the ball was found, with the abiding distress in the region of the heart, this occasioned probably by the coagulum, the formation of which may have been due to the presence of this ball immediately beyond the valves, is conclusive evidence that the ball rested in the ascending aorta from the moment of the accident.

Wounds of the heart and its vessels, the subjects living for days and even months, are not of such rare occurrence. Dr. Cristison reports a case where a ball was found in the left ventricle of the heart, yet there was no opening through which it entered; "the patient lived from April 14th to about the end of June, when he suddenly expired." A case is reported by Dr. Latour, chief physician to the Duc de Berg, where the ball was found in the right ventricle, resting upon the septum medium. There was great hemorrhage immediately after this wound, but on the third day he was more comfortable, and, at the end of three months, the wound cicatrized, and he suffered with only occasional palpitation three years; six years after, he died. Post mortem examination
disclosed a cicatrix in the right ventricle of the heart, and the ball resting upon the septum medium. Dr. James M. Green, of Macon, Ga., reports a case, in the Southern Medical and Surgical Journal, 1855, of a wound of aorta, the patient living a month, and then dying not from its effects.

The case of the prize-fighter, Poole, of New York city, is reported under the head of gunshot wound of the heart. The ball lodged in the septum between the ventricles, without symptoms indicating its presence. Another case of spontaneous cure of a wound in the ascending aorta is reported in the London Lancet, 1837; vol. xxxiv. These cases I have referred to as noted in "Eve's surgical cases."

---

ARTICLE X.

Report of two cases of Primary Resection at the Knee-joint for gunshot wound; death resulting in both cases. By Samuel Logan, M. D., Demonstrator of Anatomy and extraordinary Professor of Anatomy in the Medical College of the State of South Carolina, lately Surgeon in the Confederate States Army and Medical Inspector for the Department of North Carolina.

Charleston, S. C., July 27, 1866.

Prof. Joseph Jones, M. D., Augusta, Ga.—

Dear Doctor: Please receive my thanks for the copy of the Journal as well as for your kind note accompanying it. In accordance with my promise made to you at the time when I had the pleasure of receiving your agreeably remembered visit at Pocotaligo, during the war, I had set to work in good earnest to condense, revise, and arrange the medical statistics of the department of South Carolina, Georgia, and Florida, having procured the original reports from the Medical-Director's office for the purpose. I had prepared over one hundred pages of the manuscript, and was progressing in the work, when the exigencies of the service in Virginia caused my transfer, with most of the command, to that more active
field of operations. My work was thus brought to a stand still, but hoping at a future day to be able to resume it, I left the papers at my father's house, in Columbia, where they, together with all my other manuscripts, and my whole library, were destroyed by fire, by the "great incendiary" of "our common country."

I had a few professional war notes with me in the army, such as I had more recently collected, and had had no opportunity to send home for safety, as I then supposed. These I have saved, and from among them I have made up a report of the only two cases in which I deemed myself in the least justified in performing primary resection of the knee-joint for gunshot injury. The details are rather meagre; but as all such cases should be recorded, I send the report to you.

I congratulate you on the success, comparatively, of your college. We have reorganized and somewhat rejuvenated our institution, and promise you to try at least to hold our own. We were fortunate in losing very little by the war.

With sincere regard, I remain, your's sincerely,

Samuel Logan.

First.—J. P. Goforth, Private Co. K, 11th regiment S. C. volunteers, aged about twenty-five years; robust constitution and in good health; was wounded June 24th, 1864, near Petersburg, Va.; was admitted into the "field hospital" of the division, located in the city of Petersburg, about two hours after the receipt of the injury.

Pulse about ninety; no shock or constitutional disturbance of any importance; general condition, indeed, calm and good. Gunshot wound runs obliquely through left knee-joint, tearing away both articular surfaces, but producing no splintering of the cancellated structure or shaft of either of the bones, merely making a groove along the articular surfaces of the femur and fracturing the patella.

A general hospital, where he could be permanently treated, being in the immediate vicinity—not a quarter of a mile distant—and the case, on account of the nature of the wound as well as the excellent state of general health,
being considered as one in which the operation might be regarded as justifiable, while at the same time the patient preferring any risk to the loss of his leg, I determined upon resection.

The patient being placed under the influence of chloroform, the operation was performed a few hours after the receipt of the injury (June 24, 1864), by the H incision, the cross cut including both orifices of the wound.

Nearly all of the contused soft parts were excised, with the patella also, after the articular surfaces of the bones had been sawed off beyond their contused portions. The parts then seemed to present very favorable conditions for speedy union.

I consider that the removal of the bruised soft tissues contributes very materially to this result in this as in all other resections for gunshot injury, and I have always carried this principle into practice, except when a too free excision of the soft parts would involve the injury of important structures. I think that with this precaution the removal of such contused tissues should be adopted as the rule of action in such cases.

The patient soon reacted from the effects of the chloroform, and was sent to one of the general hospitals in the immediate vicinity, a long splint having been applied to the limb as a temporary expedient to facilitate his immediate removal from among the crowd of wounded who were awaiting professional attention.

June 28th. Had been too much engaged to go to see the patient before to-day. Pulse now about one hundred and ten; skin a little unnaturally warm, but moist; tongue almost natural; feels tolerably comfortable; appetite good; part slightly swollen, but not painful; limb dressed in Smith's anterior wire splint, and suspended, water dressing by irrigation being used.
July 1st. Patient not doing so well as at last visit. He is restless, and his skin is hotter; face flushed; pulse one hundred and fifteen or one hundred and twenty, and tongue rather dry; parts much swollen and somewhat erysipeloid in appearance; suppuration commencing imperfectly. There has, however, been some union of the lips of the wound. Water dressing is still used. Other cases of erysipelas have occurred in the hospital.

I regret that I was unable to see this patient again, but I afterwards ascertained that he had died within the twentieth day after the operation; I could not ascertain the precise date.

Second.—J. White, corporal, Co. I, 21st regiment S. C. volunteers, robust-looking young man; apparently about twenty-five years of age; admitted into the division field hospital, in the city of Petersburg, Va., June 24, 1864, about two or three hours after being wounded. General condition good; pulse strong, and about eighty-five; skin warm, and healthy in feeling; no shock, or if there had been any he had recovered from it.

Upon examination, a wound, probably from a conical ball, had passed through the external condyle of the right femur, laying open the joint freely, and knocking off a portion of the articular surface. The tibia was uninjured. He had also a slight flesh wound in his right arm.

The case being considered as one almost as favorable as the last, and the external circumstances being precisely the same, it was determined to give him also whatever chance of saving the limb a resection might afford. I accordingly performed the operation immediately, by the H incision, removing both articular surfaces, sawing through the femur at about one inch from the joint, merely slicing off the top of the tibia, and removing all of the contused soft parts.
The recovery from chloroform was prompt, with a healthy amount of reaction, and he was at once sent to one of the general hospitals in the immediate vicinity, with the limb bound, with tolerable firmness, to a long external splint, as a temporary expedient and to facilitate his comfortable transportation.

June 26th. Visited patient at hospital. The immense crowd upon the capacity of the hospital has necessarily lessened the degree of attention which he otherwise might have received. His bed is not comfortable, and the limb is still dressed in the temporary apparatus applied at the field hospital, which is causing some pain by its undue pressure. He is restless, with some reactionary fever, though not a great deal. Pulse about one hundred and fifteen; tongue almost natural; skin healthy and soft, perhaps a little too warm; the leg is somewhat swollen at the seat of operation.

June 27th. General symptoms much the same, but is more comfortable, the dressing having been rearranged. The limb is about as much swollen as it was yesterday, but it is only a little above the natural temperature, and gives him no pain.

June 28th. General condition much the same, but the flesh wound in the arm is not doing well. It is painful, and the parts around are swollen and red, presenting somewhat an erysipeloid appearance. The leg is the same as yesterday; in almost a natural state, if we except the slight swelling present; union appears to be taking place quite healthily. He complains of the arm, and not the leg. He still has on the same dressing.

July 8th. Have been unable until to-day to see the patient since the 28th ult. He has been removed from the tent he first occupied to a ward in one of the buildings. His general condition is rather favorable; pulse about one hundred and ten; skin moist; appetite good;
tongue soft and tolerably clean; feels more comfortable. The erysipeloid tendency in the wound of the arm has disappeared; the leg is somewhat swollen at and around the site of the operation; the wound is suppurating freely and the pus is healthy.

All retentive apparatus has been removed; nothing but what was applied at the field hospital having been ever used, and this had caused some excoriation. The limb lies free; thus every motion of the body, or foot, disturbs the relations of the osseous surfaces, and produces friction between them.

I was unable to see the patient again, but I afterward heard that he had died at some period before the 15th of July, or within twenty-one days after the operation was performed.

The notes on the above cases are necessarily imperfect; but it is believed that they are sufficiently full, though wanting in so many details, to render it worth while to report them.

The exigencies of my official duties at the time, and afterward, prevented me from procuring more full particulars, especially as the cases immediately passed from under my professional care. This latter circumstance will account for the absence of details as to the treatment. In forming an opinion as to whether the operation of resection at the knee-joint is ever admissible as a primary operation for gunshot injury, it is very important that we should have as many reports of cases as possible. It is with this view that I have deemed it advisable to hand in the results of my experience in the only two cases coming under my hands during the recent war, in which I considered that the condition of the patient, coinciding with the favorable circumstances which I had reason to expect would obtain, during the after-treatment, warranted this attempt at conservative surgery.
In respect to the influence to be allotted to these cases, in forming any generalizations on the subject, it is necessary to qualify our judgment as to the results, by bearing in mind that it was only in the case of private Goforth that the favorable after-circumstances obtained, on the presupposition of which the decision as to operating was mainly based.

The circumstances attending the after-treatment of the case of corporal White, whether avoidable or not, were certainly not such, to say the least, as ought to be expected to contribute to a favorable termination.

Taken by themselves, these cases, of course, settle no principle, but aggregated with others, it is hoped they may contribute to that result.

---

TRANSACTIONS OF SOCIETIES.

Medical Society of Augusta, Georgia.

The Medical Society of Augusta was reviewed and reorganized on the 23d of May, 1866.

The members have displayed commendable zeal, and a number of interesting questions, as the possibility of communicating secondary syphilis, through the medium of the vaccine virus, the nature and effects of the malarious poison, and the pathology and treatment of puerperal fever, have been discussed at the bi-monthly meetings.

The following Essays, read before the Society, are published in response to a resolution, requesting the editor of the Southern Medical and Surgical Journal to open his pages to the publication of the transactions.

The officers of the Society, as at present constituted, are:

President, L. A. Dugas, M. D., Professor of Surgery in the Medical College of Georgia.

Vice-President, S. E. Habersham, M. D.

Secretary, V. G. Hitt, M. D.
ARTICLE I.

AffectiOns of Difficult Diagnosis Caused by Diseased Teeth. By Dr. J. P. H. Brown, of Augusta, Ga. Read before the Medical Society of Augusta, June 20th, 1866.

The presentation of this paper, for the consideration of this Society, is done with no little diffidence and embarrassment. First, I have a consciousness of my inability to do the subject justice; and, Secondly, occupying the position of a dentist, I feel that the ground over which I must pass requires delicate stepping, lest I may be thought transcending my sphere.

We must view man as a microcosm—a little world—made up of many parts, which are so intimately united, and dependent upon one another for integrity and existence, that when we ignore one we not only mar the beauty and destroy the harmony of the whole, but our knowledge of their structure must also necessarily be imperfect.

A knowledge of structure forms the basis of all surgical and medical practice, and is equally necessary for those who wish to understand the nature and character of disease; for without a knowledge of the laws governing the life of a part all treatment is empirical. Experience may sometimes enable us to treat successfully a certain disease under certain circumstances, but experience, by itself, leads to mere routine and hobby practice. There are many men in my own profession who are so pre-eminently practical that, by means of forceps and excavators, they have completely detached the teeth, if I may so speak, from all connection with the living organism, and bidding adieu to all physiological and pathological knowledge, have rode their routine hobby into charlatanism. These practitioners never stop to inquire how the cure is really accomplished, and what is worse, they never deviate from one set course of practice; and whatever may be the condition of the part, or of the patient, their treatment remains the same.

The accomplished physician, surgeon, or dentist must possess both experience and theory, which includes not only a thorough knowledge of structure, but also a knowledge of the application
of those remedial agents brought into requisition in the treatment of disease. For this seeming digression from my subject I hope you will pardon me.

I trust you will not think it improper, or outside of my legitimate province, if I ask your attention, for a few moments, to a brief but general consideration of some of the influences and effects which the teeth, when diseased, may have upon the other parts of the body and upon the general health. When we take into account that the teeth are virilized structures, endowed with nerves and blood-vessels, and, through these nerves, are intimately connected with the great sympathetic nervous system, and through this with all the organs concerned in the production of animal life, the varied influences they possess become an additional field of observation. It must be apparent, therefore, to every medical and dental practitioner, that a knowledge of the anatomy and physiology of the fifth pair of nerves is indispensable to a proper appreciation of those pathological conditions to which these nerves are liable, and of their sympathetic derangements primarily induced by dental irritation.

Dr. Bond, in his work on "Dental Medicine," when referring to this subject, says: "As the body is a unit, knit by the closest bonds, pervaded by one system of blood-vessels and nerves, directed by one intelligence, and kept in a continual relation of function and expression by an all-pervading law of reciprocal reaction and sympathy; as diseases of other parts, and those which, in distinction to well-defined and limited affections, we call general, are capable of affecting the teeth, it might be apparent, if we had no particular facts in evidence, that the morbid condition of the teeth may produce corresponding evils in other parts, and may even involve the whole system in troubled and morbid action.

"It might also be evident that severe and long-continued pain, located in the immediate vicinity of the brain, and in parts little accessible to soothing appliances, can not be less dangerous to health than pain in other organs situated at greater distances from the nervous centres and more easy of access.

"It might also be perceived that sensitive organs, in immediate
contact with the great living membrane of the thoracic and abdominal cavities, and intimately connected with it by function, can not be less capable of propagating disorder to it than parts located far from it, and having no immediate relation to it."

In commenting upon the effects of diseased teeth upon the system, Dr. Rush, one of the most comprehensive and accurate pathological observers that ever lived, remarks: "When we consider how often the teeth, when decayed, are exposed to irritation from hot and cold drinks and aliments, from pressure, by mortification, and from cold air, and how intimate the connection of the mouth is with the whole system, I am disposed to believe they are often unsuspected causes of general, and particularly of nervous, diseases. When we add to the list of these diseases the morbid effects of the acrid and putrid matters which are sometimes discharged from carious teeth, or from ulcers in the gums, created by them; also the influences which both have in preventing perfect mastication, and the connection of that animal function with good health, I can not help thinking that our success in the treatment of all chronic diseases would be very much promoted by directing our inquiries into the state of the teeth in sick people, and by advising their extraction in every case in which they are decayed. It is not necessary that they should be attended with pain, in order to produce disease; for splinters, tumors, and other irritants before mentioned, often bring on disease and death, when they give no pain, and are unsuspected as causes of them. This translation of sensation and motion to parts remote from the place where impressions are made appears in many instances, and seems to depend upon an original law of animal economy."

As natural as these inferences are, and as important as they must be to every reflecting mind, I hope you will pardon me when I advance the opinion that the medical profession generally have not paid that attention to this subject which its importance demands. Without wishing to tire your patience, I will give a few cases, showing some of the disorders that occasionally arise from dental irritation.
Case 1. Abscess and loss of a portion of the hard palate, caused by the irritation of a diseased tooth.

This case came under my notice some seven years ago, in Atlanta. The history was related by the patient himself. Some four years previous to my seeing the case, an abscess formed in the centre of the palatine arch, which was lanced by his physician, and a large quantity of pus discharged. The place did not heal, but left a fistulous opening, which continued to discharge small quantities of matter. Finally, the edges of the opening inflamed and enlarged to the size of a filbert; the discharge consisting of pus and sanies.

One of his central incisors becoming troublesome, it was extracted, when it was found that there was a fistula running from the root of the tooth to the opening in the palate. The discharge of pus soon ceased, but a portion of the palatine bone necrosed and exfoliated, leaving an opening in the hard palate of the size of a ten-cent piece, which communicated with the nasal cavity, rendering the performance of the functions of mastication and deglutition very difficult, and greatly impairing his speech.

For this gentleman I constructed an obturator, which he wore with comfort and satisfaction. I will here remark that this patient was free from syphilitic taint, but had what may be termed a scorbutic diathesis. He informed me that caustic had been freely applied to the abscess, and he had taken internal remedies, but he could observe no improvement in his case, until after the extraction of the diseased tooth. In subjects of this constitutional indiosyncrasy, the slightest irritation of a dental nerve may involve the death of the tooth; or, the irritation may be reflected to some neighboring part. The teeth of such persons always require the most careful and thorough treatment.

Case 2. Sir Astley Cooper, in his "Surgical Lectures," has recorded the following cases as illustrating what he terms sympathetic irritation.

A lady, in Essex, had for a long period been afflicted with a fungoid granulation, which protruded through an ulcerous opening in the cheek, and which had resisted the use of every means-
Upon stating one day that a tooth near the part was occasionally painful, she was recommended to get it drawn; the tooth was extracted, and the fungus quickly disappeared.

"A gentleman of my acquaintance," says Sir Astley, "had, for many years, been exceedingly annoyed by an ulcer on the chin; every attempt to heal it having proved ineffectual, it was considered incurable. At length, one of the teeth opposite the wound becoming painful, it was extracted, when, to the delight and astonishment of the patient, his malady disappeared."

The eruption of the dentes sapientise, especially those of the lower jaw, is frequently attended by great suffering, and may give rise to serious disturbance. Velpeau relates several cases in which mal-position of the wisdom tooth was followed by necrosis and exfoliation of large portions of the inferior maxilla, fungus growths, immobility of the jaws, epilepsy, and insanity. The nervous disturbance is sometimes so distant from the seat of the primary cause as to present serious obstacle to a correct diagnosis.

Case 3. Hysteria from the eruption of a wisdom tooth.

Dr. B. W. Richardson, senior physician to the Royal Infirmary (London) for diseases of the chest, in his lectures on "the medical history of diseases of the teeth," relates the following case:

"A girl came under my care in 1855, and remained as a patient for many weeks. Her symptoms were those of hysteria, but from the description of the fits which, according to the mother's statement, she suffered from, I judged that she must be subject to epilepsy, or at least to severe epileptiform hysteria. I treated her first with tonics, but no good having resulted, and feeling that some local mischief must be at work, I gave purgatives on the speculation of the presence of tape-worm or lumbricus. It was clear that tonics did not relieve, and that depressants increased the malady. Ultimately, there were general twitchings in the muscles, not exactly amounting to chorea, but such as are seen sometimes after the administration of strychnia. I was unavoidably kept from dispensary work for a few weeks, and returning to it was surprised to find a great improvement in this patient. She had been in great pain and had cut a wisdom tooth, since which
she had lost all symptoms of convulsive start. How I blamed myself for carelessness in not having examined for this simple cause of irritation, I need not say. How quickly I should have examined for it had my patient been in her first, instead of her last dentition, I need not explain. Suffice it, that I never meet with hysteria now, of extreme kind, if the excitant seems to be local, without asking in the most solicitous manner after the wisdom teeth."

Dr. W. Tyler Smith, a medical writer of distinction, remarks that: "Irritation of the tri-facial nerve seems, in rare cases, to excite abortion. It happens when no cause can be recognized but the appearance of the dens sapientia, and this phase in dentition is known to produce considerable local and constitutional disturbance. General convulsions may, in fact, be excited from this source, either in the male or female subject. The reflection of irritation from the tri-facial upon the uterine nerves, in young pregnant women, is no more remarkable than the strangury excited by teething in the infant."

I might enumerate cases of amaurosis, neuralgia, headache, tetanus, rheumatism, and dyspepsia arising from dental irritation, but the foregoing are sufficient to fully impress the mind with the importance of the subject. I will close this paper with a quotation from Mr. Liston, in his treatise on surgery: "From the presence of carious teeth, or decayed portions of teeth, many evils, both local and general, may ensue, besides inflammation and abscess. They are frequently the cause, and the sole cause, of violent and continued headaches; of glandular swellings in the neck, terminating in, or combined with, abscess; of enlargement and inflammation of the tonsils, either chronic or acute; of ulcerations of the tongue and lips, often assuming a malignant action from continued irritation; of painful feelings in the face, tic-douloureux, pains in the tongue, jaws, etc.; of disordered stomach, from affections of the nerves or from imperfect mastication; of continued constitutional irritation, which may give rise to serious diseases."
ARTICLE II.

The Probable Causes of Malaria and Epidemical Diseases. Read before the Medical Society of Augusta, Ga., July 18th, 1866.

By Col. George W. Rains, formerly Professor of Chemistry in West Point, U. S. A.

Mr. President, and Gentlemen of the Medical Society:

In speaking on the subject for this afternoon's discussion, I think it proper that I should first state my views as to the nature of force, so far as to explain the term points of force employed in the question proposed. To give a comprehensive definition, I should say that Force is anything which can cause motion, either in bodies or in the ultimate atoms of matter. This definition would then include as forces sound, heat, magnetism, light, electricity and chemical affinity, actinic or photographic rays, nervous influence and vital action, as well as gravitation, cohesion, etc. These primary forces act in connection with the ultimate atoms of matter to which they impart motion, and as each atom is supposed to be indefinitely small, we may regard them practically as mere mathematical points. What may be the actual dimensions of such particles, is a question which has never been answered. We know, however, that if we reckon them up in weight, in parts of a grain, or in dimensions, in parts of an inch, we should have to employ the term billions, at least, or more probably quadrillions; indeed, the belief is entertained by many, and is daily gaining ground, that they have no dimensions at all, but are truly mathematical points, whence emanate attractions and repulsions. The air around us is composed of such atoms, each one associated with heat, light and electricity; hence each atom may be regarded as a mere point, from which radiate forces in straight lines, or rays in all directions; or we may say the air is composed of points radiating forces, or simply points of force.

The belief has generally been entertained that there are marked differences and broad distinctions between the inorganic and organic worlds, as well as between the vegetable and animal kingdoms. I think, however, that to-day the certainty of such conclusions is far less strong than it was considered some fifty
years ago. Every day we appear to break down some of the separating barriers, until some believe that after a time there will be but slight obstructions left, if indeed there shall be any left at all. Between amorphous matter and a highly organized vegetable, there exists a deep gulf of separation; also between a tree and an animal; but between the lowest vegetable structure and the highest inorganic form the difference is not so striking; the lower organisms mingle insensibly together, so at times it is difficult if not impossible to say which is the vegetable and which the animal.

In the frosty forms on windows in freezing weather, we have beautiful representations of some of the palm species; and when nitrate of silver is crystalized and viewed in the microscope, and colored green by polarized light, it would be taken by any one not acquainted with the facts to be a growing shrub or sprig of moss, the representation being perfect. It is said that if bichromate of potash be crystalized on a film of gelatine, not only is a tree-like form produced, with its limbs and branches, but actually rhomboidal fruit appears to hang pendant in the foliage. Again, granules of starch, which is a vegetable structure, regularly formed by growth in the cells, when viewed in the microscope by reflected light, looks very much like transparent rounded crystals. The constituents of all organisms, whether vegetable or animal, are mineral elements, and it was long supposed that the peculiar combinations of those elements selected by the vegetable and animal kingdoms could not be formed in the laboratory, but were the exclusive results of life-action. It is now well established, however, that this was an error, as not less than one thousand of such organic compounds, such as urea and its compounds, acetic acid, methyle, amylene, the alcohols, naphthaline, glycerine, grape sugar, etc., have been produced artificially or without the agency of vitality.

All vegetables and animals are mainly composed of air and water, the latter holding carbonic acid in solution, and only two or three per cent. of other matters. Motion can not be held as the characteristic of the organic world, since certain vegetable germs have no motion, and finely-divided matter diffused in liquids in many cases has a distinct molecular movement, and the crystals of
camphor in small fragments move about on the surface of water with considerable activity, closely resembling the movements of some of the infusoria. Crystals grow in size by attracting such particles in the surrounding solution as are suitable to their formation; the same thing is done by vegetable organisms. The hard seeds of plants, when placed in a watery solution of such elements as are required, will decompose, or its constitution will be broken up, by attracting and assimilating the proper materials, and the result is a shrub or plant. Also, if a piece of zinc be placed in a solution of acetate of lead, it will partially dissolve, and at the same time will attract the precipitated atoms of the metal in solution, and the observed result will be the growth or formation of a beautiful metallic shrub.

In making these comparisons, I do not pretend that we are unable by examination to say which is the organic form and which the inorganic structure, but merely to draw attention to the fact, that the broad distinctions hitherto held as existing between the organic and inorganic worlds no longer exist; that as the animal forms imperceptibly pass into the vegetable, so those of the latter, when our knowledge shall be more extended, may also be found to gradually fade into inorganic structures.

The power which attracts the atoms of amorphous matter together we call chemical affinity, or chemical or electrical force, and that which holds together particles of the same kind we term cohesive force; crystalic force attracts and unites the atoms into regular forms, and vital force attracts and unites the proper atoms into organized forms. It is not seen why this latter force should be considered as differing from the others, except in being of a higher order. They are all means or agents in the hands of the great overruling Intelligence to work out His designs and fulfil His plans.

Having thus set forth in detail, as far as my limits will permit, what I understand by the term force, and points of force, I will now pass on to the consideration as to whether such points of force may not exist intangible to the senses which may be capable of self-division, equivalent to propagation or multiplication.

The first appearance of a new existence or formation, whether
it be animal, vegetable, or mineral, is a minute transparent point just perceptible to the highest powers of the microscope. As it grows or expands by assimilating the suitable surrounding elements, if it be a mineral, it assumes some definite crystalic form; if an organism, it is observed to be more or less globular in form, and consisting of an outer enveloping sac enclosing an albuminous liquid or semi-liquid, and having a dot or nucleus in its centre. In the earlier growth, in some instances, there appears neither enveloping sac nor nucleus, but merely a rounded mass of gelatinous substance. Such is the beginning of all life, from the simplest photophyte to the varied and exceedingly complex structure of man, as is well known to those whom I now have the honor of addressing. In the formation of the crystal the ultimate composing atoms or points of force appear to act in certain directions with more energy than in others; and hence, in their association, the resulting form is in general angular, or developed with regard to certain fixed lines, axes, or poles. In the growth of the organic structure, the vital or formative force appears to act or radiate from the centre, in the primitive vesicle. If we suppose a single point of force acting in all directions, but with power lessening as the distance increases from the centre, and that to a certain distance it is attractive to certain elements in the surrounding medium, but beyond such limit the attractive force becomes too feeble for such an effect, then there would result a globular form of organized matter, or in other words a living existence of the simplest kind.

In the further development of the simple organisms, a constriction begins to appear apparently without cause, which, becoming more and more defined, ultimately ends in dividing the cell or individual into two perfect cells or existences. In this operation, the point of force acting from the centre, and represented by the dot or nucleus, began to divide itself into two parts simultaneously with the first appearance of the constriction around the cell or globule. It would thence appear that the division of the central point of action into two parts necessarily determined the division of the enveloping cell into two individuals. Each new cell thus formed repeats the process of forming two separate cells, and thus
proceeding in a geometrical ratio until, within a few hours, the number perhaps may be counted by millions.

In some cases, if two of the cells after separating touch each other, the point of meeting dissolves away gradually, until the two cells entirely mingle their contents, and a single cell is the result. The product of such fusion or conjugation is remarkable, for the compound cell dries up into a hard grain or spove, which may last indefinitely, floating about in the air, or under favorable conditions will develop cells similar to the original ones, which by binary division will form new structures of agglomerated cells covering extended areas. The growth of such plant is favored in some cases by cold and damp, whilst the union of two separate cells into one, or the act of generation resulting in the spove, is promoted by heat and dryness. Thus, during the Spring and cooler part of the Summer, such kind of vegetation may grow luxuriantly, but it requires the hotter and dryer portion of the season to develop the sporules, which, from their minuteness, are carried off by every passing breeze. The size of the spoves in some species of the cryptogamia is very small: thus I have measured the average spove of the styansus caput medusæ and found it about the one five-thousandth of an inch in diameter, or so small that such a drop as would adhere to the point of a needle would contain sufficient space for fifteen millions. Indeed, there appears to be no limit to the smallness of size in the minutest organisms of infusorial life, and as the power of the microscope is increased it brings new, and before invisible, points of life into view, just as the increased powers of the modern telescope resolves into mathematical shining points the distant nebulae of space. It is then clear that organisms capable of self-division and propagation may and probably do exist beyond the utmost powers of our best microscopes, and hence that countless sporules may float in the air invisible to man, although assisted by the highest powers of modern art. Such existences we may call sporules, atoms, or points of force, and they may ever remain as invisible as the particles constituting the various odors, and can only be known to exist, like the latter, by their effects on the exceedingly subtle nervous or vital forces.
I will now examine into the effects on the nervous and vital forces produced by the introduction of sporules into the circulating system, either by inoculation or by being drawn into the blood by inhalation of the air in which they float. It will be premised that the vital force of an organism attracts each atom of its structure, or that each atom is enveloped by the vital force precisely as it is enveloped or conjoined to the force of heat, and when such atom shall be removed from the general system, it carries with it its corresponding envelopes of associated forces; hence the loss of a certain number of atoms composing the structure of a living organism would result necessarily in the subtraction of an equivalent amount of vitality.

On the introduction of the sporule or germ into the blood, a contest immediately arises between the vital forces of the spove and those of the blood: the former endeavoring to attract to itself the nutritious elements of the latter suitable to its development. If the animal be in vigorous life, all the forces of its system are in full activity, and the spove seeks in vain to overcome the resistance opposing the disintegration of its constituents. If, however, the number of sporules or germinal cells introduced into the blood be so great that their combined power exceeds the resisting forces of the latter, or if from other cause the vital force of the blood should have been previously reduced too low, then the attractive power of the sporule will succeed in drawing to itself such of the elements of the blood as it may require, and the development of cells having commenced, proceeds with accelerated rapidity by self-division and reproduction.

Thus the constitution of the blood is gradually disorganized; each removed atom has taken with it a portion of the vital force; the energies of the system become impaired; the portions of the blood disorganized by the attractive forces of the sporules, withdrawing some of its constituent elements, remain as foreign matter which must be eliminated. Thus additional work is thrown on the excreting organs, already weakened by the abstraction of a portion of the vital force from the general system. The loss of vital energy, and the deteriorated condition of the nutrifying fluid, prevents its full normal action, and an increased waste of
tissues takes place, the components of which have also to be removed from the system by excretion or combustion. This disturbed condition of the general function of the system results in fever, a particular discussion of which, as well as of the chill which precedes it, does not immediately belong to the subject under consideration.

What is that which vitiates the air in particular localities, producing intermittent, remittent, and bilious affections? has been a question probably from the earliest ages of civilization. The bad air or malaria of the Poretine marshes ages ago caused the wealth and fashion of Rome to leave the pestilential atmosphere of the city during the two warm months of Summer, and seek a purer breathing medium in healthier localities.

Everywhere, when the warmth, moisture, and fertility of the soil is favorable for the rapid production and decay of vegetable and animal life and tissues, we find malaria. Thus marshes, swamps, and stagnant water in warm climates, or during the warm season of the year, infect the surrounding air, as is well known; even in healthy localities, if the firm soil for the first time is broken up, thereby exposing innumerable vegetable fibres to rapid decay, and perhaps also releasing imprisoned sporules and germinating points, malarial influence is experienced. Thus in the comparatively healthy districts of South Florida, in 1848 and 1849, I found in every case where the soldiers broke up the ground, whether for the purpose of policing and ditching the camps, throwing up earth-works, or in gardening, malarial fevers ensued, notwithstanding every precaution was taken to preserve health; and when, at certain points considered very unfavorably situated, I took the precaution to prevent any disturbance of the soil, the men under my command enjoyed good health for such localities. Thus new agricultural countries must abound in malaria, because of the breaking up of new soil, and old cultivated districts become healthier, because of the gradual decomposition of those organic matters which were peculiarly favorable for the generation of poisonous fungi, sporules, or exhalations. Hence even in old districts the dwelling-houses should not be in the midst of cultivated grounds, but as far as practical removed from
them; not the sides of hills or elevations fronting on plantations, swamps, marshes, creeks, or rivers, but beyond the crests of such rising grounds. The warm rays of the sun striking such elevated places with more freedom than the shady bottoms, cause a rarefaction of the air, which rising more or less vertically, has its place supplied by the poisoned air of the low grounds. Thus, a dwelling on the side of a hill, unless protected by a thick growth of trees, would be exposed to a daily current of malarial atmosphere from the bottom lands, and would be in a worse situation than if located on the lowest adjacent land.

Warmth, moisture, and decaying vegetable matter are suitable conditions for the growth, in general, of cryptogamia with the rapid evolution of the innumerable sporules of the fungi. From the circumstances attending the production of malaria, it would appear to be either air containing floating sporules, germinal vegetable or animal cells, points of force capable of propagation, or air mixed up with the diffused gases arising from organic decomposition.

At Mont-faucon in Paris, there are extensive enclosures called Huacker-yards, where thousands of animals are slaughtered as worthless, or the dead bodies carried there to save the skins and to allow the carcasses to putrefy for the purpose of manure. From this mass of putrescent animal substances are evolved all the gases given off by vegetable decomposition, and several others in addition, of the most nauseous and disagreeable odors, involving ammonia and the compounds of sulphur and phosphorus. Notwithstanding, the numerous workmen with their families who live in the midst of this most offensive effluvia preserve excellent health; indeed, the family of one of them named Friand, consisting of his wife and five children, were in remarkably robust health, although they had all the year round worked and slept in a place which was actually unapproachable, on account of the stench, to the members of the Commission appointed by the Government of France to examine into the matter. Moreover, these workmen live to be old men and women, many above seventy and eighty years of age.

Again, all the gases given off by vegetable decomposition are breathed at times in the laboratory of the chemist, in a more concentrated condition than ever takes place in the natural decomposition of such bodies, without any malarial effects whatever. It is
true, the long breathing of carbonic acid and carbonic oxide, when in appreciable amounts, will lower the vitality of the system, and perhaps, in conjunction with other causes, may at times produce typhoidal disease, like anything else which would diminish the energies of the body whilst certain conditions prevailed; but I presume there exists no accredited case of a healthy person living in a healthy atmosphere who had had malarial fever from the effects of any single or compound gas.

In the matter of epidemical poison in the air, there is still less foundation to suppose it results from the admixture of a deleterious gas or exhalation. It is well known that Asiatic cholera was engendered in the Souderbund marshes of the Ganges in India, and thence spread through the English army in 1817, whence for the first time it became the terror of the civilized world. In the same district of country a pestilence like the plague, preceded by cholera, arose in 1860, and for the three succeeding years swept off many thousands of the inhabitants. Dr. Elliot, of the army, who was sent to report upon the disease, attributed it to malaria and water filled with decaying organisms.

It is evident that, whatever may constitute epidemical poison, it cannot be gases, since it propagates itself, and extends from place to place, far beyond the original locus. It must be, then, either a peculiar propagating organism, propagating points of force, or an electrical phenomena.

But how can electricity act? It is a primary force like light and heat, and like them is diffused in matter and throughout space. It can indeed energize the oxygen of the air, into ozone, and can diminish its normal activity into autozone, and such changes might doubtless cause variations of health throughout wide districts of country. But why should electrical action follow particular streets of a city, or one side of a street, or one bank of a river, or follow exclusively the lines of travel? Electric force can not be carried about in the clothes, or propagate itself from house to house, or adhere to the stools of cholera patients, which is said to be a main source of its propagation. It is well known that electricity can be produced by friction of the clothes, or, indeed, by any species of molecular disturbance, but who ever
heard of such producing cholera, or any other disease? The important fact that the excrements of cholera subjects are the principal sources of contagion, bears strongly on the probability of the poison being organic points capable of propagation. It may be asked, why could there not be minute poisonous atoms floating in the air, or deleterious unknown gases, which would thus poison the blood and cause disease? Doubtless such may be the case, but we must admit in epidemics such points or deleterious gases to be capable of propagation, otherwise the disease produced would soon terminate for want of cause, and if propagative, then they come under the definition either of organisms or propagative points of force.

There are three ways of poisoning the blood, resulting in disease or death, viz.: First, by fermentation caused by the inoculation or reception of bodies capable of producing such action; Second, by chemical combination with the foreign substance; and Third, by what is termed catalytic action. Fermentation is the breaking up of the constitution of the blood by organisms which feed upon some of its elements, thus separating into new compounds such portions as are acted upon; the ultimate of fermentation is putrefaction and dissolution. Some of the ferments are vegetable, and some animal; generally the decomposition of animal tissues is effected by infusorial animalcules, the smallest commencing the operation, viz.: the monas crepusculum, and bacterium termo, according to the researches of M. Pasteur, a distinguished French chemist. The size of these animated points is so minute that the smallest specimens imperceptibly fade away under the highest powers of the microscope, and are only known to exist at certain points by the slight movement of the liquid which surrounds them. Thus I have at first, in the sanguinious matter from an ulcer, seen only a kind of motion in the semi-liquid mass with a magnifying power of four hundred diameters, but with a careful increase of power and arrangement of light, I have detected countless thousands all in active movement. An idea has been attempted to be given of the relative size of these excessively minute organisms, by saying that thousands of them might sail side by side through the eye of an ordinary needle.
The poisoning of the blood by chemical combination with a foreign substance is well seen in cases of poisoning by arsenic or corrosive sublimate, which unite with the albuminous tissues or parts, and thus, rendering them solid, incapacitate them for further vital operations. This action of these two substances renders them virulently poisonous to all life, for every organized body contains albuminous compounds essential to its structure. Thus, arsenic, or chloride of mercury, in solution, when given in small doses, would completely destroy the malarial spores or germinating cells, which may have been absorbed in the blood. The blood globules being larger, and hence supposed to have a larger amount of vital resistance, would not be sensibly affected unless the amount taken should be too large, in which case they also would be killed.

What is called catalytic action is the production of a certain effect in compound bodies, without any apparent change in the agent employed, and is probably an electrical phenomena. Thus a mixture of oxygen and hydrogen gases may remain perhaps indefinitely without change, but on the introduction of a clean piece of platina foil they immediately combine and form water.

If a piece of metal be in the slightest degree electrified, it will cause the explosion of fulminate of silver. If the blood be inoculated by an organic poison, as that of the snake, an immediate action commences, and in a short time the vital force, as such, is destroyed. This species of poisoning is entirely distinct from that of fermentation or malaria, for whilst the latter find their proper field of action in a debilitated, nervous condition of the system, and consequent weak resisting power, the former acts with greatest energy when the nervous force is in best condition. Thus it is said to take less organic poison to destroy life in a vigorous organization than in a feeble one. In other words, the poison acts directly on the nervous and vital forces, and its action is in proportion to their energy.

This would seem to indicate a possibility that those forces could be so lowered in polarity, by being brought into contact with certain agents, as to change their nature or become transformed into others, just as light, heat, and electricity are correlative, or
capable of being converted the one into the other. The fact exists that the nervous and vital forces gradually disappear under the action of such poisons, and as it is held that no force can be lost under any circumstances, the question arises, what has become of them?

Alcohol, and the alkaloids, such as quinine, morphine, nicotine, etc., also appear to act directly on the nervous force; their first effects being stimulative, or increasing the energy of the nervous power, they would hence appear as the antidotes of the above kind of poisons. There must be floating in the air, in the neighborhood of localities favorable for their propagation, a number, more or less great, of minute animal organisms, the dead remains of which must be absorbed in the lungs, and there act in some measure like particles of putrid blood, poisoning the system. The same conditions, favorable for the development of vegetable organisms, would favor the production of such animalcule, and hence attending malarial poison of the blood would be the organic poison affecting directly the nervous force. Hence, if arsenic, mercury, etc., be used to destroy the vegetable germs, then alcohol, quinine, morphine, etc., would be indicated as the proper agents to neutralize the action of the decaying animal germs; or, as the two kinds of poison probably prevail together, then a mixture of the two species of antidotes would suggest itself for malarial influences, such as doses of arsenic and brandy, or arsenic and quinine.

Arsenic, mercurial compounds, and the alkaloids, have long been employed as the proper remedies for malarial fevers, and it is interesting to trace out the chemistry of their use.

As regards the supposition that malaria and epidemics may be caused by organisms floating in the air, I will here quote the substance of the remarks of Dr. G. Robinson, in an address made to the British Association, 1863. The author alluded to the circumstance of the analogy between many of the phenomena of fevers and other zymotic diseases, and the ordinary process of fermentation having been perceived and recognized by Hippocrates and the oldest writers on medicine. Their idea was, that a poisonous ferment, existing in the atmosphere, entered the mass of the
blood, and induced in it a series of changes, which gave rise to
the excessive heat and other peculiarities of that class of disease.
At the present time, this doctrine, modified by the discoveries of
Liebig, and other chemists, has been adopted by most physicians,
and forms the basis of the classification of disease framed by Dr.
Farr; and used by the registrar-general. It thus supposes living
germs to exist in the atmosphere, which, when introduced into
the body, give rise to a specific and regular series of morbid
actions, pursuing a definite course in a definite time, as in small
pox, those germs being disclosed and multiplied, and producing
others capable of reproducing in other bodies the same succession
of changes. (An. Sci. dis., 1864.)

I trust the foregoing remarks, however inadequate in elucidation,
will prove suggestive, and assist in drawing attention to a
subject of great interest to mankind.

ARTICLE III.
Remarks upon the supposed influence of the mother in the produc-
tion of Nævi Materni, or congenital "marks," and other de-
formities. Read before the Medical Society of Augusta,
August 1st, 1866. By L. A. Dugas, M. D., Professor of
Surgery in the Medical College of Georgia, and President
of the Medical Society of Augusta.

The love of mysticism and the vain desire to account for every-
thing, have led men into some of the strangest vagaries with
regard to the origin, or immediate cause, of those blemishes of the
skin and malformations of the body so often observed in new-born
infants. The most common interpretation of these "marks" is,
that they result from the longing desire of the mother, during
pregnancy, for some particular article of food, which article is
thought to be faithfully represented by the blemish on the skin;
and, as the color of these marks varies from a pink flush to a
reddish brown, they are most frequently supposed to be pictures
of strawberries, cherries, or other fruit; sometimes of roast beef,
ham, etc. Other marks and malformations are attributed to the
surprise or alarm of the mother at the sight of some hideous or
frightful object during her pregnancy. The locality of the mark
is said to be determined by the application of her hand at the time
to the corresponding part of her own body. Hence, the precaution recommended in such cases, to apply the hand promptly to some concealed part of the surface, in order that the mark of the child may be covered by his garments and not be unsightly. Woe be to the child if the mother carries her hand to her face when she is "longing" for a dish of strawberries, or is shocked at the sight of a toad, for the offspring will then be terribly disfigured! These superstitions are so generally known, and, I may say, believed, that it is unnecessary to enter into a more detailed account of them. Let us now examine the matter a little and see if there are any grounds for the belief, or rather if it be possible for such effects to be induced by such causes.

The only rational grounds for the belief are to be found in the occasional coincidence between the alleged cause and effect. But even these are so rare when compared with the countless number of instances in which the effect fails to follow the cause, that they must lose much of their force upon the slightest investigation. Hideous objects have been known to frequent the thoroughfares of London for many months without giving rise to a solitary well-authenticated instance of deformity in anywise resembling them, although they must have been seen by thousands of women, at all stages of gestation. A cause so rarely followed by any effect can scarcely be entitled to be considered as a spectacle carefully to be avoided by women lest the foetus in utero be made to bear the marks of their temerity. Again, was there ever a woman who, under the influence of the derangement of the functions of the stomach, and the capricious appetite peculiar to pregnancy, did not, more or less, ardently desire some article of diet she could not obtain? And yet how does the number of children born with marks correspond to the number of those who come into the world without the evidence of such longing? This absence of sequence will become more striking if we bear in mind that inasmuch as the mother must have, in every instance, desired quite a variety of things, it can never be difficult to assign the mark to some object it may be supposed to resemble.

But science furnishes us the strongest argument against this superstition. The laws of foetal evolution have been so successfully
studied during the present century, that we are now enabled to solve many problems heretofore incomprehensible, with regard both to the nevi materni and to the malformations or monstrosities, as they are technically called, which we occasionally meet. Among the principles that bear upon our subject, the following may be mentioned:

1st. That, with the exception of the heart and organs of digestion, the early product of conception consists of two lateral and symmetrical halves, which subsequently come together and are agglutinated upon the median line so as to constitute one body.

2d. That the process of evolution proceeds from the periphery to the centre; those portions most remote from the median line being formed first and the others last. Hence, the fingers are formed before the hand, this before the forearm, and the arm proper still later; the ears exist before the eyes, these before the nose; and so also with regard to the trunk.

3d. That any arrest or cessation of evolution before it be completed must result in malformation, corresponding to the stage of evolution at the time of its arrest. If, for example, after the hand has been eked out of the body, the process of evolution be arrested, the child will be born with a hand where the shoulder should be, and consequently with neither forearm nor arm. If, after the formation of the ears, head, and eyes, there be no farther evolution, and the two halves become then agglutinated, the nose and the central portions of the upper-jaw will be wanting at birth. Cyclops are thus formed by the union of the lateral portions of the head just at the time when the outer half of each eye had been completed. The arrest of evolution leaving only one half of each eye formed, these halves have come together so accurately as to resemble one perfect eye on the median line. Cyclops can never have a nose, because of the arrest of evolution and of the union which has taken place before it could be formed.

4th. The failure to unite the two halves at any point of the median line must leave fissures where none should exist. Harelips and cleft palates are thus produced.

5th. Whenever two products of conception or distinct foetuses become united during their evolution, the connection always
occurs between homologous parts; or in other words, parts dissimilar in the two never unite. Union takes place of face to face, back to back, side to side, sternum to sternum (as with the Siamese twins), shoulder to shoulder, etc.; but we never find the face of one united to the back of another, nor the shoulder to the hip, nor any union of parts dissimilar.

6th. The process of evolution may be excessive as well as incomplete; when excessive in certain portions of the capillaries, these blood-vessels, which are in the normal state too small to be seen with the naked eye, now become so large as to carry red blood and to impart to the locality (if in the skin) a corresponding degree of redness. This is the way in which marks are formed. An excess of evolution may also produce supernumerary fingers or other appendages.

With these principles in view, we must be prepared to admit that if the emotions of the mother ever affect the foetus so as to induce deformity, this must be done at the precise time at which the deformed locality is undergoing evolution; for the difficulty would much increase if we had to presume that, after the evolution had been completed, the emotions of the mother would destroy it and reproduce an anomalous one in its place. In the case of hare-lip, for example, which is one of the simplest deformities resulting from a failure of timely agglutination of the parts, to suppose it to be induced by an emotion occurring after the formation of a healthy lip, would be to admit the possibility of a destruction of normal tissues and the extension of skin over the edges of the newly formed fissure.

One of the most hideous deformities, and one unfortunately too common, is that which results from an arrest of evolution before the development of the brain and cranial bones. The child is then born with neither brain nor head proper, while the face is fully developed, which gives it a monstrous appearance, not unfrequently compared to a toad or bull-frog. Would it not be taxing the credulity even of a fanatic in such matters, to suggest that any emotion of the mother could induce the destruction of such extensive and important organs after they had been formed? The cause, whatever it may be, which gives rise to such a deformity,
must be operative before the evolution of these portions of the body; for it clearly results from an arrest of evolution. I may be permitted here to cite an instance somewhat analogous, which was attributed by the accoucheur, a physician of high standing and of large experience, to the sight of a giraffe during the last month of pregnancy. The child presented a deformity of the head, which was said to assimilate it most strikingly to a giraffe. I requested permission to examine the monstrosity with the gentleman in attendance, and found it to be simply a case resulting from an arrest of evolution in the cranial bones; but not in the brain. The consequence was, that the hemispheres of the brain, not being bound down by bony matter, stood up somewhat like cones; and these were the bodies supposed to correspond to the ears of the giraffe! In all other particulars the child was well formed, and lived several days. Now, if the sight of the giraffe had had anything to do with this deformity, it must have occasioned the destruction of the whole scalp and of all the bones of the cranium in the course of the few weeks which elapsed between the unpleasant spectacle and the birth of the child. And yet it is probable that this wonderful effect will be handed down from generation to generation among the credulous friends who witnessed it, as positive evidence of the correctness of their belief! Almost every family circle hoards up some story of the kind, in which the most circumstantial details are given to establish authenticity; but although I have sought every opportunity to investigate the correctness of the inferences, I have never yet seen one which would sustain the belief in the slightest degree.

Is there any reason to believe that emotions of the mother's mind can affect the evolution of the foetus in utero? This is an interesting question to physiologists, and one that has engaged their serious attention from time to time. In order to answer it, we must first determine the ways, or means, by which communication is established and kept up between the mother and the foetus. There is between the two an obvious communication by means of the blood; for it is through the mother's circulation that the foetus is nourished. The placenta is attached to the inner surface of the uterus, whence it continually derives nutritious blood from
the mother, and returns that rendered unfitted for this purpose by its course through the foetal vessels. So far as the minutest anatomical investigations may be relied upon, there is no nervous communication whatever between the two. No nervous filaments have ever been found running from the uterus to the foetus. I believe that some anatomists have imagined that they traced nervous filaments into the placenta, but I can just now recall none who pretend to have followed them any farther. In the present state of our knowledge, we can not admit that there exists any other than a sanguinious communication between the mother and foetus; and this seems to be all that is necessary for the well-being of the product of conception. If analogy be worth anything in settling such questions, we should observe that in oviparous reproduction all communication is cut off as soon as the egg becomes encased in its shell. The chick is nourished and developed at the expense of the pabulum enclosed in the shell. This yolk, or pabulum, having been supplied by the mother in sufficient quantity, all communication is cut off, and with it the nervous influence, if any previously existed. It should also be remarked that malformations are exceedingly common in our domestic fowls, and that they occur in strict accordance with the principles we have adduced as governing them in the human family.*

In conceding that the foetus in utero derives his nourishment directly from the mother's blood, it follows that the development of the foetus may be influenced by the quality of the food supplied. But, while this might affect the development of the body as a whole, it is not easily understood how it could affect only certain localities, and, still farther, do so under the temporary influence of a desire for special articles of diet, or of a sudden emotion, however strong. A mother pining away under protracted derangement of the functions of digestion, or long-continued grief, which might likewise impair her functions of nutrition, might give birth to a puny child; but this does not reach the cases under consideration, in which the defects are altogether local.

* The Medical College of Georgia contains a very valuable collection of monstrosities, not only human, but also representing nearly all our domestic animals. In every instance, whether of single or double monsters, the same laws are observed, and the deformities of the lower animals correspond exactly to those in the human subject. Will it be urged that the mental emotions of the hen, the cow, the mare, the sow, etc., have occasioned these modifications of development in their young.
Indeed, it is generally found that those who are born with malformations, referred to an arrest of evolution in a certain locality, are rather prone to an excess of evolution in the unaffected parts of the body.

Finally, if the mental emotions of the mother ever reach the foetus, this must be done through the nervous system, which can alone convey them from the brain. We know of no other channel through which the operations of the brain may be conveyed to the other parts of the system. It is through them that the brain receives the impressions made upon all parts of the organism, and it is likewise through them that the mandates of the will are transmitted to every muscle of voluntary motion. If there be no nervous communication between the mother's brain and the system of the foetus, and none has ever been detected, is it not preposterous to attribute an extensive and most curious class of phenomena to the influence of the mother's mental condition upon the intrauterine offspring?

There is no denying the occasional occurrence of coincidences well calculated to impress the unreflecting classes of society with a belief in the superstition we are combatting. The case I have cited, in which the sight of the first giraffe that was brought to this city was followed by the birth of a child deformed in that particular manner, carried conviction to the mind of those who may have doubted before; and especially when sustained by the credulous accoucheur. It is probable that any other deformity would have met with the same interpretation in that case, for the menagerie contained quite a large collection of wild beasts, some one of which would have supplied the place of the giraffe if this had not answered the demands of the imagination. If the child's skin had presented a number of marks, the leopard might have been made to father them.

I saw another striking case of coincidence, which occasioned quite as much sensation as the one referred to. I was requested to visit a little negro who was suffering with paraphymosis, attended with retention of urine, and was waited upon by a negress in her last month of pregnancy, who assisted me in drawing off the urine with a catheter and in reducing the strangulation.
About a month after this a messenger came for me, stating that this woman "was delivered the night before of a son who was affected just as the other little negro was, and could not pass his urine." I found accordingly that the new-born infant had a fissure of the prepuce, resulting from an arrest of evolution, and an occlusion of the meatus urinarius by mucous agglutination, which prevented the escape of his urine. The meatus being opened with a probe, the urine was immediately passed off. Nothing could be more conclusive, and it is needless to add that no argument I could adduce had the least influence in shaking a faith so strongly confirmed. And yet, in this case, the fetus was eight months old when the unpleasant sight was witnessed; his genital organs were then, of course, fully developed, or rather deformed, in the way in which he came into the world. If they were not deformed at eight months, how could they become so at a later period? The history of dreams, and of coincidences in general, is full of curious and inexplicable facts, which we must admit, but which we should be careful not to invoke in support of superstitions entirely at variance with sound knowledge and subversive of all we know to be true.

We are now prepared to understand the philosophy of the simplest, as well as of the most complex, deviations from the normal evolution of the body; and if we can not fathom their remote or ultimate cause, the reason is to be found in the law of nature which fixes a limit to our understanding. We know the ultimate cause of nothing whatever. Why does an apple fall to the ground? Newton has discovered the law by which this is effected, and answers that it is attracted by the earth. But why is it attracted? We can go no farther. The discovery of the law is the limit of our abilities. We are continually asked why it is that one person is born with blue eyes and another with black; why is one person fair and another brown; one with good teeth and another with bad ones! We know the laws by which all these peculiarities are brought about, but can not divine why these laws have thus controlled the evolution of each individual so as to make it different from others.

Nevi materni may involve the blood-vessels, the pigment coat,
and the hair follicles separately, or jointly, and be slightly raised above the general surface, or not at all so, giving very different appearances to the "marks."

When the blood-vessels of a certain part of the skin are in a state of hypertrophy, or of excessive development, the "mark" presents various hues of red from a slight flush to crimson, according to the different degrees of hypertrophy and quantity of blood there concentrated. These marks are more florid in the Spring and Summer, when the cutaneous circulation becomes more active, which circumstance is attributed by the vulgar to the relation the marks bear to certain fruit which ripen and turn red at that time.

Although this condition of the blood-vessels usually remains stationary after birth, instances are not rare in which, if not excessive, it gradually disappears. I have seen a number of children born with slight florid marks on the face, which entirely disappeared in one, two, or three years, without any interference. Sometimes they are cured by the supervention of some disease. A child a few months of age was brought here from the country with quite an extensive red nevus of one side of the face and lips. A surgical operation was proposed for its destruction, which I opposed, because of the danger it involved. The child, fortunately, escaped the ordeal, and was taken home. Not very long afterward, the whole face became invaded with crista lactea, which ran its usual course, with the exception that it was worse over the nevus than elsewhere, and left the child completely relieved of her congenital deformity.

But sometimes the hypertrophy goes on increasing after birth, or may begin to do so in the adult, so as to result in a very formidable disease. They occasionally degenerate into malignant affections more or less unmanageable.

An excessive or perverted action of the pigment coat, by which the coloring matter of the skin is secreted, will produce patches more or less dark; and if the hair follicles are also affected, these marks may be covered with a more abundant growth of hair than the adjacent surface. An arrest of the evolution of the pigment coat in the whole skin of a negro will make him an albino. White rabbits, white mice, white crows, etc., are all produced in like
manner; and it is curious that in all these cases the coloring matter of the eyes is equally wanting; hence the intolerance of light, with which they suffer.

In some cases we find the development of the hair growth to be excessive and general. The hirsute woman and children, who exhibited themselves throughout our country some years ago, were striking instances of this kind. Simply bearded women are more common.

*Harelip and cleft palate* we have seen to be dependent upon an arrest in the union of the lateral portions of the body before its completion. This occurs occasionally in the spinal column. The whole, or only a portion, of the posterior surface of the spinal canal remaining open, the watery fluid, which fills the membranes by which the spinal marrow is surrounded, accumulates. As these membranes are not supported by the usual bony walls, they gradually yield, until they form a large pouch projecting from the affected region, and give rise to considerable deformity. This is what we denominate *spina bifida*. It is not only a malformation, but a frightful disease, which goes on increasing, and is necessarily fatal.

I have already noticed some of the most striking cases of deficient evolution in the brain, cranium, and scalp. Children may be born with imperfect hands, feet, and limbs; sometimes without any at all.

The most curious monstrosities are those which result from the union of twins. In the case of the Siamese twins, so generally known, it seems that their development went on naturally and separately until they were brought in such close contact that they adhered or grew together just at the lower end of the sternum or breast-bone. Why did not the sternum of the one adhere to some other part of his brother? Simply because the *law* which governs such cases forbids it. Instances are on record in which twins have been thus cemented by the soles of their feet, others by the crown of the head, some face to face, back to back, side to side, etc. In all these cases the individuals were at one time separate and distinct, and the subsequent union does not obliterate their individuality, however great may be the apparent fusion of
both into one. *Ritta Christina*, extensively known in Europe, had two heads and necks, four arms, and only two legs. From the umbilicus down there appeared to be but one child—a well formed girl. While one head was asleep, the other might be awake and playful, or crying. They lived upward of a year, when one of them sickened and died; the other, in good health until then, gasped and died, also, immediately. A post-mortem examination showed that their brains, spinal marrows, and nerves were distinct; that they each had a heart, but that these were inclosed in a common sac, or pericardium; that the digestive organs were distinct down to the large intestines, where they became merged into one canal. It was thus explained why their appetite was distinct, whereas their desire to defecate was common or simultaneous. Pain was perceived by the right head when the corresponding leg was pinched, and by the left when the same impression was made upon the other limb. Now, what had become of the missing portions of each body? They were absorbed or destroyed by the pressure by which the individuals had been forced together, when the tissues, being in a soft and almost gelatinous state, would readily lose their vitality.

Sometimes the pressure operates unequally upon the two beings, and results in the destruction of a very large portion of one body while the others have not suffered. We then have fragments of one body attached to another, which is otherwise well-developed. A cow was to be seen in our streets for a number of years who had the fore-leg of a twin dangling from her shoulder. It is remarkable that in all these cases the fragment, however large or small, obeys the law already enunciated, and unites only to a corresponding portion of the body of the other.

Having already extended these remarks far beyond the limits I had intended, I will conclude by urging upon the members of this Society an unbiassed and philosophical examination into every case that may present itself of supposed maternal influence upon the production of defective or anomalous evolution. A well-kept record of such investigations would be exceedingly interesting, for it is only by the collection of facts that we can ever expect to demonstrate the fallacy of the popular belief on the subject.
ARTICLE IV.

Penetrating Wounds of the Knee-joint: treated at Chimborazo Hospital, Division No. 2, Richmond, Va. By S. E. Habersham, M. D., Surgeon in charge, and Vice President of the Medical Society of Augusta, Ga. Read before the Society July 18th, 1866.

The object of this paper is to call attention to the results of conservative surgery in gunshot wounds of the knee-joint, treated at Chimborazo Hospital, Division No. 2, hoping that it may induce other surgeons who may have the records of their own experience, to publish them in vindication of the Southern medical man, whose labors in the late sectional war should be a part of our glory, and of which we shall be robbed, if their names remain buried in the oblivion of private case-books. This mode of publication is the more important, since all of the carefully-prepared records in the C. S. Surgical Bureau were entirely destroyed by fire on the 3d of April, 1865.

The number of cases here reported are too insignificant for the purposes of statistics, yet they serve to show that, under favorable circumstances, many wounds heretofore deemed cases for amputation or resection may recover under the existence of favorable conditions, to be mentioned hereinafter; and though the writer does not presume to take issue with the eminent authorities and advocates for operative interference in all cases of gunshot wounds of this joint, yet he must believe that this rule will be somewhat modified when the results of Confederate surgery are published to the world, which can only be done through the voluntary contribution of every surgeon who has matter in his possession. Already has the result of conservative surgery in compound fractures of the femur somewhat materially shaken our faith in the application of European experience to this country, and the number of recoveries from wounds of the knee-joint in all the divisions of Chimborazo Hospital, if they could be obtained, would throw valuable light upon a question requiring farther elucidation, before we can subscribe to the rule laid down even by Dr. Hamilton, an American surgeon, who says: "Gunshot wounds involving the knee-joint demand amputation in
almost all cases. Guthrie has seen no recoveries from gunshot wounds of the knee-joint, unless the limb was amputated. We have seen a few recoveries, especially when the joint was penetrated by round balls, or when the joint was slightly opened."

Against secondary or intermediary amputations we certainly put in our demurrer, when the joint is simply perforated by the ball, or is within reach of the bullet forceps, and can be extracted without opening the joint too effectually. In support of which opinion the following cases are submitted.

Before, however, introducing these cases, it will be necessary to make a few preliminary remarks upon the hospital in which these results occurred, nor is it deemed irrelevant to the subject to consider the material of which the medical staff was composed, as explanatory of the cause why conservative surgery prevailed to so great an extent as it did in the early part of the war. Many of the surgical staff were called from the peaceful practice of their profession in small country towns, where operative surgery was seldom practiced, and when necessary, the more experienced city physician was generally consulted, hence it was very difficult for these men to bring themselves to realize the full force of the necessity of amputation, when the external appearance was simply a small slit, or circular hole in the skin, therefore many operations were postponed which, by the rules of art, should have been performed primarily on the field. In many cases nature was allowed to do her part unaided, save by such means as placing the patient in as comfortable a position as possible, the maintenance of secretions, regulation of diet, and removing such foreign bodies as presented at the orifice of the wound. Under this treatment, with careful nursing, many wounds of the most serious character manifested decided tendencies to recovery, so that the secondary operation was postponed from day to day until there was no question of ultimate recovery. On the other hand, there were those of more operative skill and experience in surgery who, appreciating the advice of military surgeons being on hospital duty, were generally obliged to wait for the secondary period or condition before amputating, and when this condition was obtained, it was deemed by them safe to subject the patient to conservative treatment, rather than expose them to the almost
certain death which attended intermediary and secondary amputations in hospitals. Experiencing the same beneficial results of postponement, they, too, became the advocates of conservative surgery, particularly when compared with secondary amputations. In time this influence extended to the field surgeon, who often, forced to reserve many cases "for a more convenient season," only operated upon those manifestly requiring immediately his attention, giving the others the benefit of a doubt, which often resulted in good to the individual, and saved, to many, useful limbs.

In a short time the experienced physician became an excellent consulting surgeon, and before the war terminated I doubt whether there could be found, in any army, more judicious, experienced, intelligent, and successful practitioners than was the surgical staff of the Confederate army; and this the records of the staff would show, could they be recovered from the ashes which has buried for ever, I fear, these herculean labors, excepting when here and there a few isolated cases may be published from the private records of individual surgeons. In no department of the staff would this have appeared more honorably than in the compilation of reports made by that intelligent and industrious officer, Surgeon F. Sorrel, General Inspector of Hospitals, and his able and hard-working assistant, Surgeon Baehr, which, but for the untoward accident of fire, would have enriched the field of military surgery, particularly in data on the subject of the conservative treatment of gunshot fractures of the femur and penetrating or perforating wounds of the knee-joint. Could these records be exhumed from the ruins of the War department, and published to the world, the Confederate medical staff, with its able, working, and discriminating Surgeon-General, would stand out as lovers of their profession and their race, contending against disease and wealth with all their energies, while the resources of their art were cut off by the cruel policy of the Federal Government, which declared medicines contraband of war, so that it was often, even in hospital, impossible to obtain a single dose of morphia to relieve the most excrutiating pain. This, however, is no place to recall painful associations, and this is only mentioned here to show one of the many difficulties we had to contend against in the treatment of the wounded.
Situated on the eastern confines of the City of Richmond, upon a plateau of ten acres (at least one hundred and fifty feet above the banks of James river), terminating in a precipitous bluff on the east, south, and west, and on the north in a wide cultivated field, the site of Chimborazo hospital possessed all the advantages of an eligible location. In addition to this favorable site, cool, stiff breezes from the southeast, coming across a wide river and immense extent of field and woodland, continually wafted the contaminated atmosphere of the hospital into the fields beyond, while many springs of cold, pure water, of 58° or 60° Fahrenheit, gave an abundant supply of nature’s most refreshing and healthful beverage, so essential to the modern surgeon, and which has altogether supplanted the fomitic poultice in military surgery. With ample room for the accommodation of our wounded, we were generally enabled to give each patient from eight hundred to one thousand cubic feet of atmosphere, and when a purer air was deemed essential in any particular case, our wounded were isolated in tents, furnished for the purpose by the admired foresight of the Surgeon-General, which were pitched in open areas, in proximity to the hospital. The beneficial influence of this change was often manifested in the rapid improvement of gangrenous wounds, and sloughing phagardena.

During the battles around the city in 1862, many of the wounded were transported to the hospitals directly from the field, in private carriages, comfortable hacks, and ambulance wagons, and being immediately attended to upon their reaching the hospital, were thus placed under the most favorable conditions for recovery. Some cases, however, reached us in a moribund condition, having never recovered from the shock of the wound, while others, quite numerous, were transported long distances by rail or ambulance wagon, and consequently suffered the unavoidable neglect incident to the transportation of large numbers of wounded without a sufficient medical staff to afford them proper assistance. This evil helped to swell the mortuary report of the hospitals to a greater degree than any other cause, for it is certain that many wounded lost their lives who, under more favorable conditions of transportation, would have recovered.

The abundant ration supplied to the army of Northern Virginia
in the first year of the war contrasted very greatly with that of the period following the retreat of General Johnston from Manassas, and the subsequent operations upon the Peninsula, around the City of Richmond; in consequence of which, the soldiers brought into hospital manifested a decided tendency to all the diseases growing out of an impoverished state of the blood, such as scurbutis, purpura, sloughing ulcers, etc.; hence, wounds seldom manifested highly inflammatory complications, but on the contrary, the reverse, requiring a tonic diet and stimulating beverages in the outset to bring about sufficient action to resist the wasting and prostrating effects of suppuration. Thus the advantages derived from the favorable condition of the hospital, and the early removal of our wounded from the field-ambulance, were very much counteracted by this evil of spare diet requiring the utmost attention and discrimination in the attending surgeon, whose supply of stimulants was very meager, and generally confined to impure new whiskey, with an occasional bottle of brandy, reluctantly furnished by the medical purveyor, who, I suppose, had very little in store.

Now, that the war is over, and we are enabled to contrast our difficulties with the immense advantages enjoyed by the Federal surgeon in his superior resource and unlimited supply of every necessity, nay, every comfort for his wounded, the wonder is that our results of treatment should compare even favorably with theirs, and yet in several characters of wounds the credit would be in favor of Confederate surgery.

In no character of gunshot injury was unexpected success more manifest than those included in the following summary and history of cases:

Total number of cases admitted from July, 1862, to April, 1865, 25; known to have recovered, 6; furloughed, but not heard from, 3; transferred as convalescents, 4; unaccounted for, 3; died in hospital, 6; in hospital April, 1865, recovering, 3.

We have, in the above summary, a known mortality of six cases, or twenty-four per cent. Suppose, however, of the three furloughed but not heard from, four transferred as convalescents, and three unaccounted for, twenty-four per cent. died, we then have in
all a mortality of nearly twenty-seven per cent.; the three, however, who were furloughed were certainly in a fair way of recovery, else the board would not have acted in their cases; the three unaccounted for may possibly have died, though this is not probable, else the fact would have been mentioned in the copy of surgical reports. It is, therefore, more probable that they were transferred to some country hospital, and in the hurry and confusion attending some of these transfers (of a hundred men at a time, in a few hours after receiving the order), the clerk may have omitted to mention the fact in the copy of report. But, even if we allow among the two above enumerated the twenty-four per cent. of deaths, we have a most favorable result, very much at variance with the statistical records of all previous surgical experience, and mainly attributable, no doubt, to very favorable hygienic influences in the hospital; the persistent and judicious use of cold water, and the tender care manifested for the sick and wounded by our valuable matron, Mrs. Pember, who spared no pains in the preparation of the diet prescribed for them, often supplying from her own stinted resources the deficiencies of the supply furnished by the hospital department and city market.

Case 1.—Penetrating wound of knee-joint, by conical missile, causing pyemia and death.

I. P. B., private Co. I, 2d S. C. infantry, was wounded on the 2d July, 1862, and admitted to hospital on the next day, with wound on external side of left knee; synovia escaping; ball extracted; no fracture detected; a high degree of inflammation resulted in profuse suppuration, and pyemia terminated the case in a few days.

Case 2.—Penetrating wound of knee-joint by conical missile. Pyemia; death.

T. B. S., Co. —, 2d N. C. regiment, wounded June 28, 1862, and admitted 30th, with penetrating wound of joint; synovia escaping; no fracture detected; missile lodged, but not discovered. Synovitis supervened on third day of receipt of wound, and pyemia terminated life on the 11th July.

Case 3.—Penetrating wound of knee-joint; synovitis, terminating in gangrene; amputation and death.
W. P., Co. A, 34th N. C. artillery. Wounded June 27th, admitted June 29th, with penetrating wound of knee-joint by conical missile, fracturing patella, and lodging. Health good, and quite an athletic man. At the time of admission there was so little appearance of even external inflammation that it was thought to be a glancing shot, confirmed by the statement of the soldier that he had walked a mile without much pain after being wounded. On the fifth day of admission synovitis supervened, and, on consultation with surgeon McCaw, amputation was determined upon, it having been discovered that the head of the tibia was fractured. On the 9th day of July, free suppuration having been established, and the patient being in a proper condition for secondary amputation, it was determined that the operation should be performed in the cool of the afternoon. In an hour or two the wound was attacked with gangrene, implicating the whole surface of the knee, and amputation was performed before the prescribed hour, by Assistant Surgeon Wall, the patient not losing more than two or three ounces of blood, notwithstanding which, he commenced to sink in a few hours after the operation, and died on the sixth day after from suppurative discharge. An examination after amputation revealed fracture of head of tibia, with injury to external condyle of femur.

This was the first case of true malignant or hospital gangrene that occurred in the second division of Chimborazo hospital.

Case 4.—Wound of the knee-joint by fragment of shell, opening synovial sack and grazing external condyle of femur. Recovery.

I. S. N. private Pegram’s battery, aged 19. General health good. Wounded May 24, admitted next day. Wound by small fragment of shell, which entered at external edge of patella, grazing external condyle of femur, and making exit through quadriceps tendon, with escape of synovia from lower wound. When admitted, patient was suffering much pain, and the knee was much swollen from synovitis. The limb was immediately elevated on pillow, cold drip applied, and one quarter-grain tartar emetic prescribed every two hours, until nausea occurred, then reduced to one eighth-grain every two hours, or, in case this should nauseate, to one sixteenth-grain. The former was suspended sometimes for a few hours, and the latter occasionally omitted.
Tenth day. Inflammation subsiding; complains of drip—use wet rags instead; tartar emetic suspended.

June 6. Discharge of synovia ceased; lower wound granulating on edge; discharging serum as if from joint; upper wound healed, covered with white film.

June 16. Lower wound healed. Some enlargement of knee, with pain upon motion; some slight inflammation has occurred; return to cold drip.

June 18. Cold drip having proved uncomfortable, was suspended after a few hours trial, and wet rags substituted; knee natural in temperature; no pain upon slight motion of limb.

June 24. Patient being anxious to be on his feet, suspended his leg by sling, passing under foot and around neck, and permitted him to walk about the ward for a few minutes.

June 26. Patient brought before furlough board, and sent home for sixty days—in charge of a friend.

Case 5.—V. S. left knee-joint, by conical missile, entering an inch below outer side of patella, passing into joint and lodging against integument on its inner side, from which it was removed, with one or two spiculae of bone, by incising integument.

W. H. S., aged 23, Co. B. Pegram's battery. General health good; was wounded 24th May and admitted into hospital the same day. Knee very much enlarged; inflamed and very painful, with profuse discharge of synovia; high inflammatory fever; limb was elevated on pillows and cold drip applied; tartar emetic as in other case every two hours, and diminished according to effect; half-grain sulph. morphia at bedtime to insure rest and benumb pain.

May 26. Knee not more enlarged; external inflammation greater; synovial fluid still escaping from both wounds; synovitis acute. Continue cold drip; canteen to be frequently filled with fresh water from spring; continue tartar emetic. Ten grains calomel, to be followed in six hours by half-ounce sulph. magnesia in eight ounces water.

May 28. Wound attacked with erysipelas; removed to tent; suspend cold water; paint with tinct. iodine; stop tartar emetic and substituted twenty drops mur. tinct. iron three times a day, in
half-tumblerful of water; half-diet. This treatment was continued for fifteen days, when the erysipelas had subsided and patient was returned to his ward.

June 26. Discharge from joint has altogether ceased; wound of exit showing tendency to heal; slight constipation, indicating saline aperient; continue wet-rag application, which had been used constantly after return to ward; full diet.

June 30. Patient unusually cheerful upon promise of furlough; pulse natural; temperature of joint natural; sleeps well, and eats his full ration.

July 6. Swelling of joint nearly reduced; inner wound nearly healed; outer one discharging dark-colored serum; continue full diet and water dressing.

From this time there was a gradual improvement, terminating in recovery, with stiff joint, and he was furloughed by board some time in July not stated, for sixty days. When he left hospital, joint was nearly of natural size.

Case 6.—Y. S. left knee, by conical missile, entering on the outer edge of patella, making exit at centre of politeal space, with escape of synovia from both orifices, and recovery, with stiff joint, in forty-nine days.

J. F. F., aged 25, private Co. B, 47th cavalry, was wounded May 7, 1864, and admitted into hospital on the following day, with joint very much swollen, a deep inflammatory blush around articulation, and particularly wound of entrance. This wound was accompanied with great pain. The patient was of strong constitution, in perfect health, and appreciated fully the danger of the wound and the necessity of obeying implicitly the directions given to his nurse. The limb was elevated upon a pillow, the cold drip immediately applied, and continued unremittingly for fifteen days, affording the patient so much comfort that he was able to attend to it himself. On the fifteenth day a pustular eruption appeared, covering the joint, no doubt the effect of the continued use of the cold drip. This eruption resembled that produced by tartar emetic ointment, and was extremely painful, attended with the most intensely itching sensation. Upon the
appearance of this eruption, the swelling of the joint immediately subsided, and wet-rag applications were substituted for the drip; synovial discharge ceased.

May 28. Wound healed; swelling of joint nearly absent; pustular eruption discharging, showing no tendency to resolution, and still quite painful; continue cold water application; full diet; patient having been on half-diet.

June 13. Eruption disappearing; nearly absent; joint nearly natural in size, but stiff.

June 21. Patient perfectly recovered, with stiff joint; furloughed by the board for sixty days.

This patient reported at expiration of his furlough with stiff joint. The revulsive effect of the eruption in this case, no doubt, expedited recovery. It will be seen that the continued use of cold water was the only remedy used; that he was only on half-diet for twenty-one days. When he appeared before the board he presented the appearance of perfect health.

Case 7.—V. S., left knee by conical missile, which entered at inner edge of patella, passing into joint, comminuting end of femur and lodging in popliteal space against integument; was removed by incision on the field. Escape of synovia from both orifices; death in fifty-three days after receipt of injury.

J. O., private Co. G, 11th Va. infantry, of scrofulous tendency and leuco-phlegmatic temperament; was admitted on the 8th May, 1864, having been wounded three days before; was suffering much pain in joint when admitted, which presented all symptoms of acute synovitis and joint greatly enlarged; pulse full and rapid. This patient expressed great anxiety as to the result of his injury, and seemed to have a fixed presentiment that he would never recover. The cold drip was applied and the limb supported on pillows. Full doses of morphia, to allay nervous excitement and produce sleep, and the patient assured of his recovery, to allay mental inquietude. Here I would remark, that this fixed presentiment of death is almost a certain indication of an unfavorable termination, even in slighter wounds than this, acting upon body as well as mind, he is left without hope to sustain the body in its struggle to repair the injury.
Sixth day of admission. Profuse hemorrhage from upper wound, easily arrested by elevation and ice applied to the wound. Notwithstanding every means used to subdue inflammation, it did not begin to subside for some days, when profuse suppuration set in, and incisions were found necessary to give exit to pus in joint, which flowed in enormous quantity, and subsequently burrowed along the thigh, from which it was discharged by incision also. As no means seemed to exert any influence in postponing the termination of this case in death, I will simply state that the patient died from exhaustion on the 27th June.

In the treatment of this case, Smith's anterior splint was used, and found to add very much to the comfort of the sufferer.

Case 8.—V. S., left knee, by conical missile, which entered the joint one inch above and external to patella, passing out at flexion of joint near centre of popliteal space. Recovery in one hundred days.

W. H. U., private Co. E, 17th Va. infantry, wounded May 16, and admitted into hospital on the evening of the same day. Joint much swollen and very painful, also profuse discharge of synovia from inferior orifice of wound; cold drip applied as in other cases, and patient put upon light diet, which treatment was continued to the twenty-sixth of May, when, from the peculiar appearance of the discharge, seemingly an intimate mixture of pus and synovia, and the great enlargement of the joint, it was thought advisable to incise lower wound to give exit to pus. None, however, flowed, for the discharge was of so tenacious a character as to block up the incision as well as the superior wound. The general health of the patient being very good, it was resolved, upon consultation with the attending ward surgeon, to wait a few days and see the result before incising again, and the wet-rag application was continued, the limb being placed on its side.

May 30. Appearance of joint unchanged, excepting slight diminution in size; cold having proved disagreeable, warm water was substituted for a few days, but a tendency to increased inflammatory action induced us to return to the cold water dressing, with small, not nauseating, doses of tartar emetic. It was not found necessary to incise the joint again nor to suspend the cold water dressings
during the progress of the case. Tartar emetic was discontinued in twenty-four hours. Gradual improvement in joint commenced about the 10th June and continued until the 25th day of September, when he recovered with ankylosis, and was furloughed for sixty days, but never returned to hospital.

Case 9.—V. S., left knee by minnie missile, fracturing head of tibia and making exit near external condyle of femur. Death from pyemia.

W. G. H., October 24, private Co. K, 44th Va. infantry. General health good; wounded February 6, 1865, and admitted February 9. The only record found of this case is, that the wound was very painful, discharging synovia freely; prognosis unfavorable; should have been amputated on field; died March 14, of pyemia.

In connection with this case, which is only introduced to call attention to the character of wound, viz: Fracture of the head of the tibia, and the remark of the attending ward surgeon, "should have been amputated on the field," I would remark that this complication was considered necessarily fatal.

In the summary and above history of nine cases, are included all the knee-joint wounds admitted from the 28th June, 1862, to the 3d of April, 1865, and I regret the loss of a second volume of manuscript, containing the history of the remaining cases from which the summary is drawn, precludes the possibility of my continuing the history of the cases.

The three cases unaccounted for were admitted during my absence on a sick leave of two months, consequently no notes were taken in their cases, and they simply stand upon the register as admitted with penetrating wound of knee-joint, and some other insignificant data. Even the fact of their transfer is omitted, and the probability is, that they were so disposed of, since their deaths would certainly have been mentioned. At the time of my absence, the exigencies of the army called for a large number of assistant surgeons, and it so happened that most of the officers attached to the second division were those selected, while contract physicians were substituted, who knew nothing about the routine duties of the hospital. Coupled with this evil the clerk, whose duty it was to attend to the hospital register, having no one to overlook him, neglected his duty, and
finally deserted, and then much valuable data was lost which might have been collected under other circumstances. Enough, I trust, however, has been shown in the above nine histories of cases to elucidate the character of injury for which we claim the benefit of conservative surgery.

When it is recollected that irritative fever and inflammation set in sooner in wounds of the knee-joint than in any other cavity, excepting the lungs, that gangrene sometimes terminates the life of the patient within five days of the receipt of the wound, the necessity of prompt action on the part of the field surgeon is manifest, and therefore the great importance of fixed rules, from which there should be no departure, inasmuch as a few hours' delay might result in irreparable injury to the individual and render nugatory all the advantages of conservative surgery.

The hospital surgeon, who sees all of the above-mentioned evils when too late to remedy them, and has learned too well the danger of secondary amputation, or the long suffering and ultimate termination in death of a badly selected case for conservative treatment, as was that of Oliver, No. 7, is probably the best judge as to the character of wounds likely to recover under favorable conditions, and therefore the greater the importance to be attached to his opinion upon this class of injury.

The deductions drawn from histories of cases, by others, are not to be compared in value with those convictions resulting from a personal familiarity with the cases, and studying them from day to day through the many phases of conditions likely to occur in their treatment. I, therefore, trust that if, in suggesting the following rules for amputation, there should appear aught of egotism, it may be attributed to a desire to give the results of individual experience and the opinions deduced therefrom, rather than the dogmatical expression of an idea, which the observations and experience of others may falsify. It is, therefore, with the hope of being corrected, if wrong, that I am induced to offer the following rules for amputation in this class of injury:

*These remarks, of course, do not refer to Mr. W. Walker, of Virginia, who remained at his post to the last day, and to whom I am indebted for valuable clerical services.*
1st. That amputation should be promptly performed in all those cases attended with laceration of the soft parts surrounding the joint, and opening the synovial sack, or where the tibia or condyle of the femur are either of them fractured. We say nothing of the graver injuries to the joint, for here, as in the case of lacerated wounds, the indications are too palpable. The patient should have the advantage of conservative surgery, if the wound is simply a penetrating or perforating one, grazing either of the condyles, but the grazing of the head of the tibia is of more serious import, necessitating amputation wherever it occurs. If the wound, then, is simply a perforating or even penetrating one (providing the missile can be extracted), and has not grazed the head of tibia, or fractured the entire condyle, an effort should be made to save the limb. When this is determined upon, the limb should be put in a splint, as for fracture of the thigh, leaving the joint uncovered, the object being to prevent the least motion in the articulation. Any of the ordinary dressings may be used to the wound during the transportation of the wounded man to the hospital, and the injuries of this class should always be accompanied by a proper attendant, to see that the physical comfort of the patient is attended to, and that the irritating tendency of the wound is not aggravated by motion of the limb or the want of ordinary dressings during the journey. Opiates should also be given to benumb sensibility, for of all wounds these are the most painful. If the above conditions obtain, and the patient be of sound health, and not of strumous or cachectic habit, an effort to save the limb will probably be attended with success, but the case will require the utmost attention on the part of the surgeon and nurses.

As to the treatment to be adopted in these cases, this must be left to the judgment of the attending surgeon, who alone can decide upon the indications of the case, which may arise from day to day. He alone can determine when to use the cold drip, or when to substitute the simple cold water dressing for it; when to administer anodynes and when to withhold them; when to administer sedatives, such as tartar emetic, and when to incise. Hence, no one, however great may be his experience, can lay down any fixed rule for treatment in individual cases, and in the opinion of the writer, that
surgeon who advocates free incision of the joint as a preliminary to treatment is in error, as such a proceeding was never instituted by any of the surgeons who had charge of the cases included in this article.

The writer was induced to suggest the use of tartar emetic, as adopted in some of these cases, from the very favorable influence it has seemed to exert in arresting paronychia and pereostial inflammations generally. In none of the successful cases were the joints ever entered by probe or finger after admission to the hospital, it having been taken for granted that the field surgeon had done his duty in this respect; consequently, we could only be guided by the direction the ball had taken, as manifested by the wounds of entrance and exit, the escape of synovia, the appearance of the ball (whenever in possession of the man), and the escape of spicule during treatment, in forming an estimate of the amount of injury inflicted.

In the local treatment of highly-aggravated inflammation, I have never had the objection to cold water common to many surgeons of much greater experience than myself, for the reason that I have always found it the most powerful means of controlling local inflammation when constantly applied. In those cases where it has done harm, for I have seen many such, it was either applied too soon, thus keeping down a healthy reaction in the part, thereby causing sloughing or mortification, or had been continued too long after the subsidence of inflammation. In either case the same result should have been anticipated, since by its means the vitality of the part had been kept too low for healthy supplicative action.

For information upon this subject, the reader is referred to some very judicious remarks of Surgeon Reid, in an article upon wounds of the large joints, published in the present number of this Journal, and which was read by him before the Association of Army and Navy Surgeons in Richmond. This very able paper is replete with valuable information pertaining to the subject, and comprehends everything which can be said on wounds of the knee-joint.

If, in presenting the above history of cases, the writer should be instrumental in eliciting other contributions upon this subject, he will feel amply repaid for any trouble its preparation has given him, in the consciousness of knowing that he had added his mite of
information to the treasury of knowledge, and that the little light he has been able, by its means, to throw upon the subject of Confederate surgery, has not been hidden under a bushel.

The gentlemen immediately connected with the treatment of most of the above cases, to whose skill and unflagging energies the happy results may be attributed, were Assistant Surgeons Harrison, Vaidin, and Upham, of Virginia; Wall and Saball, of Florida, and several other gentlemen who were connected for a short time with the division. I was also indebted for much valuable advice, in consultation, to Surgeon Seabrook, now of Richmond, Va.; Holloway, Professor of Surgery in the Louisville School of Medicine (Kentucky), and Surgeon Craig, also of the same State, who, from time to time, saw many of the above cases, and who finally (as members of the furlough board) had an opportunity of examining them before leaving the hospital.

ERRATA.—First paragraph, seventh line, for names, read records.

ARTICLE V.

Facts bearing upon the Nature and Effects of Malaria and Diseases at Fort Gibson, in the Fall and Winter of 1834. By General G. J. Rains. Read before the Medical Society of Augusta, Ga., August 1, 1866.

In the year 1833, the Arkansas river rose an unprecedented height, overflowed all the bottom lands, and while it benefitted some few places, it piled the sand three feet deep on others, before fruitful, and rendered them barren and desolate.

During the year succeeding this great rise, September, 1834, I joined my company at Fort Gibson, fifty seven miles west of Arkansas. I had been on duty in the Indian department at the Choctaw agency, in about thirteen miles from Fort Smith, and about three from the Arkansas river, a thick growth of timbered land intervening. The malaria had reached the agency before I left, and I had been severely sick with fever, and was convalescing, when I went to Fort Gibson, already noted, from medical statistics, as the most unhealthy post in the United States occupied by troops.

The post of Fort Gibson is situated on the east bank of the Neosho river, about two and a half miles from its confluence with
the Arkansas, having a bottom land south and southeast, in juxtaposition to that post, extending to the river, having stagnant pools, and a pond or lake, of about one half-mile in extent, in a thick canebrake, in about three fourths of a mile distant, south. In an easterly direction were the dragoon barracks, occupied by four or six companies of dragoons, and Fort Gibson, with six companies of infantry, composed of officers and men, fifty two each in number when full. The garrisons were found sickly and sickness increasing rapidly, mainly congestive fever and dysentery.

We began to bury the dead with martial honors, until the musicians became sick, and notice made that the music and dead-marches were going almost all the time. When that was stopped, our whole business was to dig graves, make coffins, and bury the dead. Out of about thirty officers there were soon but three for duty, viz.: Adjutant Miles, who, I think, had been sick, and was afterward General Miles, killed at Harper's Ferry, fighting against us, Captain Dawson, who, cadaverous looking, was said to take daily a dose of charcoal, and your humble servant, convalescing as said, with diarrhoea, a check to which immediately brought on fever.

A singular case I must here mention. Lieutenant West, of the Seventh infantry, some three or four years before, had taken the venereal disease from an Indian squaw, and had been apparently cured by Surgeon Pitcher, since of the Medical College at Detroit, Michigan; had married, and his wife had one child, diminutive and sickly. He was down with the dysentery, and Dr. Hawkins informed me that his old disease had again broken out with all its violence, and it hastened his death.

Finally, we were burying the men all day, and the grave-yard between the two commands had the prisoners of both dragoons and infantry, with other details, almost continually employed digging graves, and these accused one another of hooking their graves, the term they used, as the first that came with a corpse put it into the prepared pit.

Coffins were soon out of the question, only rough boxes were made, and to supply plank for this purpose, all at the post was used up, and the ceiling taken down from some of the rooms in the barracks, for the boards. The dragoons suffered, if possible, worse
than the infantry, being nearer the swampy land, which was just back of them, and I heard a discussion between Colonel, afterward General Mason, and Captain Johnston, of the Quartermaster's department, concerning a requisition made from the War department for the number of deaths, which was stated, could not be told, as the dragoon officers were all sick, and some men, not known, who had deserted. It often occurred that two bodies were put into the same grave together, the upper not being more than a foot from the surface of the ground, and occasionally these deposits were made after night, by candle or torchlight.

I have seen battle-scenes, but none so horrible as this, where it seemed a man's business was to die. The diseases were of three-fold character, viz.: dysentery, fever congestive, and a nameless disease, which would commence in apparently a healthy subject, as a very small aphthe inside the upper lip, which soon became a sloughing ulcer, of portentous magnitude, before it destroyed the man.

The cause of this singular disease was attributed falsely to Surgeon Finley giving enormous doses of calomel to soldiers a few months previous, when out on the Western prairies, as I had several attacks myself, which I found in my case yielded to application of sulphate of copper, and Cherokee Indians in the vicinity of the fort had it also. An estimate of the number of deaths may be inferred from a remark of Surgeon Bailey to me, that from the building which he afterward had fitted up, and occupied as quarters for himself and family, more dead bodies, of dragoons alone, had been carried out of that house that season than, if brought back again, would chink it to the roof. I examined the locality, the evident source of this malaria, and found numerous ponds of stagnant water left by the river the year before, with much decaying vegetable matter all through the woods—the water, the earth, and the air replete with organic formations in a state of decomposition, and the air visited by perfumes, the most perceptible to the olfactory nerves being something like that of the cucumber. The stagnant air, loaded with millions of dead infusoria, actually conveyed the idea that there was no such thing as malaria proper, but that so called was loaded with death, to come
in contact with the living fibre in the lungs and body of man. To go in bathing, or in any manner to check insensible perspiration for however short a time, was the certain passport to a fever.

If remembered aright, calomel was the sheet-anchor in this storm of death, and Surgeon B. M. Byrne, U. S. army, once told me that he had never lost a patient from dysentery, which he always treated with a dose of calomel, and demulcent food and drinks, and he had probably a thousand cases in his time. He considered the liver the locale of the disease, and a vitiated secretion of bile the cause.

In the winter the diseases most prevalent were severe influenzas and pneumonias—the former epidemic, the latter endemic, if not contagious, as it seemed to pass rapidly from patient to bunkmate, so that but two or three days would elapse before the death of both.

During the prevalence of the severe malarious diseases during the fall and winter of 1834, at Port Gibson, it was observed that the livers of both men and animals presented, after death, a dark, slate color. The livers of all the animals slaughtered were thrown away by the butchers, on account of their dark, unhealthy appearance.

ARTICLE VI.

Is Asiatic Cholera Contagious? Read before the Providence Medical Association by H. W. King, M. D., Surgeon-General of Rhode Island, and communicated for the Boston Medical and Surgical Journal.

This question is now of public interest, in view of the anticipated coming of the disease. Doctors disagree upon it. This is no new phase in the history of medicine. Doctors have disagreed as to the contagiousness of nearly all diseases which are most strongly influenced by epidemic conditions. It is so difficult to determine which is the prime source of disorder, when both contagious and epidemic causes are operating! Hospital gangrene, puerperal fever, yellow fever, scarlet fever, typhus fever, whooping cough, and plague were for a long time held in doubt, and
finally, after hot dispute, quietly found place, one by one, in
the list of contagious diseases.

Cholera is most prominent among those of which we are
still in doubt, and about which we may dispute. I propose
briefly to examine a few of the reasons recently given to
the public why some "physicians cannot believe cholera to
be contagious," and to extend a few remarks upon the
subject of contagion.

First. On board the steamship Atlanta, which brought the
disease to New York last November, it was confined to the
steerage during the whole passage. The fact that the
disease did not spread to other parts of the ship is relied
upon as evidence of its non-contagious character. It would
seem to me, better evidence of its non-epidemic character.
This fact, which is thought too singular for a freak of con-
tagion, has had its parallel many times in the passage of
typhus fever to our shores, and no doubts are now enter-
tained as to the contagion of typhus.

Second. The Emperor of the French, holding the destiny
of the nation, "was permitted," recently, to visit the cholera
hospitals of Paris, and did not take the disease. This act of
the emperor is considered proof that both he and his medical
advisers believed the disease to be non-contagious; that the
possibility of his taking it was not even doubtful. Does it
prove so much? The French once had another emperor, who,
with responsibilities as great upon him as ever rested
upon his nephew, was permitted to cross a bridge at Lodi,
swept by thirty Austrian cannon. Does this prove that he
and his military advisers were satisfied that there was no
danger in the passage? that the possibility of his being hit
was not even doubtful?

Third. In India, where the disease has become naturalized,
and has prevailed for a long time, the belief is universal that
it is not contagious. The same argument would prove the
plague to be non-contagious, while we all hold the contrary.
That, too, is a habitant of the East, and like views are enter-
tained of it there.
Fourth. Cholera can be arrested in its progress by proper medication, and the question is asked: "Is this true of smallpox, or any other confessedly contagious disease?" It may not be true of smallpox, but it is true of many other confessedly contagious diseases, among them itch, syphilis, and porrigo.

Fifth. In cholera there is no definite period of incubation, nor any regular stages of development in its progress and decline, while it is asserted in all known contagious diseases these stages are generally clearly marked. Is this statement true? Let us examine and compare it with the teachings of one of the best of American authors. Dr. Wood says of pertussis: "The period of incubation is from two to thirty days;" of measles, "from one week or less to three weeks or more;" of scarlet fever, "two or three days to two or three weeks;" and of typhus fever, "from immediately to several months." Each of these, in its progress and decline, is as irregular as in its development, and these are all well-known contagious diseases. The period of incubation of the latter would seem indefinite enough to correspond with cholera, or almost any other disease.

Sixth. "One attack of cholera furnishes no security against a second." Neither does one attack of gonorrhoea, syphilis, porrigo, frambesia, or itch furnish security against a second attack, and these are all contagious diseases.

Seventh. "Cholera remains quiet for a long series of years, almost constantly existing at the place of its origin, and does not extend beyond that region. Could this be true of any strictly contagious disease?" It is true of the plague, and also true of typhus and yellow fever.

Eighth. It is stated that it is an established law of cholera that the prevalence of the disease is in inverse ratio to the height above the level of the sea, or large rivers, or bodies of water in the vicinity, and the question is asked: "Was it ever known or suspected that any such law of elevation existed in relation to any strictly contagious disease?" I answer, it is known that the same law exists in relation to the prevalence of nearly all disease, both contagious and
non-contagious. The exceptions are those diseases peculiar to mountainous regions. This idea, now advanced by Dr. Snow, was used by Dr. Rush in his argument against the contagiousness of yellow fever. It is answered by stating the fact, that the law of elevation in relation to the prevalence of disease follows the law of settlements. The population of the world is so distributed.

Ninth. “Cholera is uniformly checked in its progress by cold, and prevails most severely in hot weather. Smallpox, on the contrary, and other contagious diseases, which do not depend upon actual contact, prevail most severely in cold weather.”

How is it with yellow fever? It is uniformly checked by cold; indeed, it requires a higher temperature for its existence than cholera. The question of the contagion of this disease has been more fully discussed than that of cholera, and the professional mind is generally settled in the belief that it is contagious. This brings me to a point where theory might be introduced into the argument. Do not all contagious diseases dependent upon corpuscular origin prevail most severely in cold weather? And do not all diseases dependent upon cryptogamous agency for their cause prevail most severely in warm weather? The prevalence of cholera in Russia during the winter might tend to prove one part of this hypothesis. The life of the sporule may have been protected in the underground huts, at a temperature where germination could go on, while in the clear, cold air above no epidemic cause may have existed.

The most of the arguments advanced to prove the non-contagion of cholera may be summed up in this simple statement: Cholera is not contagious, because it does not follow the same law that smallpox does; reasoning as though smallpox were the type of contagious disease, and judging all other diseases by it. As well might itch be taken for the type, and other diseases judged by that. From what has been shown, it would appear that cholera is not more anomalous than many other diseases known to be contagious,
yet it is not contended that there is any general law governing contagious disease, for there is none. Each is peculiar to itself. There may be a resemblance in form, or kind of substance producing disease, that may be classified. We have contagious diseases that are known to be of animalcular origin, as scabies, dracunculus, pulex penetrans, etc. We have others that we know to be of fungous origin, as favus, sycosis, porrigo, etc.; and others that we believe to be of corpuscular origin, as syphilis, hospital gangrene, smallpox, etc. In thus classifying, we have a resemblance in the kind of materies morbi forming each class, and here the resemblance ends. As the disease produced by the acarus scabiei differs from that produced by the filaria medinensis, and as the disease produced by variolous matter differs from that produced by syphilitic matter, so may we expect cholera to differ from other diseases, though produced by the same class of contagious matter.

In many of the arguments upon this question of contagion there seems to be wanting a clear idea of the definition of the subject. The best definition that I have seen, and the one that seems to me to convey a near idea of what is generally understood by the word contagion, is that given by Dr. Wood, in his Practice of Medicine. In this, contagion is held to be nearly synonymous with infection, but contagion is allowed a broader signification, and to embrace the meaning of both terms, including contactual and remote propagation. An agreement in the understanding of terms, though we still might differ, would save many words in dispute. With the microscope we may hope some day to solve the mystery that now divides us. It seems no deeper hidden than was the poison of malaria before Dr. Salisbury discovered that, instead of its depending upon the decomposition of vegetable matter for its origin, it has its source in cryptogamic life. He or some one else may show that, instead of cholera depending upon the "decomposition of filth," vegetable organism must exist in choleraic air, and that germ and human excrement are necessary for its growth.
The Medical Association of Georgia.

This Association convened in annual session, in the City of Atlanta, on the 21st of June last. The meetings of the Association having been necessarily suspended during the war, it was the first opportunity enjoyed by its members of communing as a body since April, 1861. We were sorry to see so few present, but are willing to attribute it more to the failure of receiving due and timely notice than any want of interest in the Association. The following officers were duly elected and installed: Dr. A. Means, President; Dr. F. O. Dannelly, 1st Vice-President; Dr. L. H. Orme, Recording Secretary; Dr. J. L. Moore, Corresponding Secretary; Dr. H. L. Wilson, Treasurer.

Through Dr. Means, Chairman of the Committee on Prize Essays, an essay was reported on Diphtheria, with the motto, "Sis sub judice," for which the prize of fifty dollars was awarded. It was from the pen of Dr. E. L. Gaillard—ordered to be published so soon as funds could be obtained.

Dr. Habersham moved to amend the Constitution by striking out that clause authorizing the admission of State licentiates to membership in the Association. After some discussion, on motion of Dr. Godfrey, the further consideration of the subject was postponed to the next meeting of the Association.

The following resolutions were adopted:

Resolved, That the permanent location of the Association at some suitable place, in the opinion of this meeting, is called for by the highest interests; and that, in view of said interests, we do invite and call upon its members, in every portion of the State, to meet with us at our next annual meeting, and settle definitely this question.

Resolved, That the sum of one hundred dollars be hereby offered by the Association for the best Prize Essays—$50 for the best, $30 for the second, and $20 for the third.

The next annual meeting of the Association will be held in Griffin, on the second Wednesday in April, 1867.—Signet & Journal.
BIBLIOGRAPHICAL NOTICES.

[From the large amount of original matter presented in this number of the Southern Medical and Surgical Journal, we are compelled to defer the more elaborate reviews to another issue.]

ARTICLE I.

A Practical Treatise on the Diseases of the Sexual Organs of Women. By F. W. von Scanzoni, Professor of Midwifery and Diseases of Females, in the University of Wurzburg; Counsellor to his Majesty, the King of Bavaria; Chevalier of many Orders. Translated from the French of Drs. H. Dor and A. Socin, and annotated, with the approval of the author, by Aug. K. Gardner, A. M., M. D., Professor of Clinical Midwifery and the Diseases of Women, in the New York Medical College; Author of the "Causes and Curative Treatment of Sterility;" Editor of Tyler Smith's "Lectures on Obstetrics," etc., with upward of sixty illustrations. New York: Robert M. DeWitt publisher. 8vo. 670 pp.

It is to the study of specialties in medicine we owe, in a great degree, the decided advances made during the present century in our profession; and the monograph before us abundantly illustrates the advantages of this system. The work is divided into seven parts, devoted to the pathology and therapeutics of the uterus; of the ligaments of the uterus; of the fallopian tubes; of the ovaries; of the vagina; of the external genital organs, and of the breast. Each subject is elaborately treated, and the author has diligently striven to make his work a complete compilation and reflex of the present state of knowledge. We know of none more calculated to be useful to the general practitioner, and regret that we can not give it a more extended notice at present.

ARTICLE II.

Outlines of Surgical Diagnosis. By Geo. H. B. MacLeod, M. D., F. R. C., S. E., eel. fac. phys. and surg., Glasgow; Lecturer on Surgery, Anderson's University; Surgeon to the Glasgow Royal Infirmary, and the Lock Hospital; late senior Surgeon Civil Hospital, Smyrna, and General Hospital in Camp before Sebastopol, etc., etc. American edition, reprinted from advance sheets. New York: Bailliere Brothers, 1864. 8vo. 505 pp.

As correct diagnosis is indispensable to safe and judicious treatment, any contribution upon the subject should be gratefully
received. While we cheerfully accord to the work before us a high degree of merit, we can not withhold the expression of our conviction that the great desideratum in diagnosis is simplicity as well as unerring accuracy, and that the author would not have sacrificed anything of intrinsic value by leaving out many of the unimportant details, which tend rather to obscure the strong points in each case than to add to their value. But this is the only complete work of the kind in our language, and we cheerfully recommend it.

---

ARTICLE III.

Clinical Lectures by Prof. A. Von Graefe, on Amblyopia and Amaurosis, and the Extraction of Cataract. Translated from the German, by Hasket Derby, M. D., Surgeon to the Massachusetts Charitable Eye and Ear Infirmary, etc. Boston: D. Clapp & Son, printers, 1866. 8vo. 86 pp.

The high authority of Professor Graefe in ophthalmology, and the new light thrown upon the important topics of these lectures, must make them peculiarly acceptable to those who devote any attention to diseases of the eye. The Germans have latterly done more than any other people toward the advancement of this branch of medicine, and we therefore naturally look with much interest to their publications on the subject.

---

ARTICLE IV.

A Comprehensive Medical Dictionary, containing the Pronunciation, Etymology, and Signification of the terms made use of in Medicine and the Kindred Sciences, with an Appendix, comprising a Complete List of all the more important articles of the Materia Medica, arranged according to their Medicinal Properties; also, an Explanation of the Latin Terms and Phrases occurring in Anatomy, Pharmacy, etc.; together with the necessary directions for writing Latin Prescriptions, etc., etc. By J. Thomas, M. D., Author of the System of Pronouncing in Lippincott's Pronouncing Gazetteer of the World. Philadelphia: J. B. Lippincott & Co., 1864. 704 pp.

This work supplies a want felt by every one commencing the study of medicine. The student will find in this medium-sized volume concise, clear definitions, and full explanations of the etymology of the various words and terms used in Medicine and the collateral sciences. Another feature of the work, of practical
importance, is the pronunciation of the various terms given in the Dictionary. "What correct spelling is to the writer, correct pronunciation is to the speaker. If either should be wholly neglected, the most perfect language would soon become a babel, and fall into utter corruption." The Appendix contains matter of value to the student, viz: table of Materia Medica, containing the names of all the medicinal articles of any importance, arranged according to their medicinal properties; table of doses; synopsis of respective nosologies of Cullen and Good; method of writing prescriptions, etc. The work is printed in the best style of the art, as is characteristic of all the works issued by the liberal and enterprising publishers, J. B. Lippincott & Co., of Philadelphia.

ARTICLE V.

Catalogue of the University of Virginia, 1865-66 (with Catalogue of Sessions 1861-65 prefixed).

Just before the close of the war, it was reported in this part of the South that the University of Virginia had been sacked and burned by the United States forces. The friends of this noble institution will be gratified to know that it passed through the recent civil war intact, without the loss of a Professor, or of a book. The catalogue before us gives proof of the undiminished confidence and interest of the public in this institution, which might well serve as a model for every college in the Southern country. A large number of the educational institutions of the South were burned during the sectional war; and all of them have been, more or less, prostrated and crippled by the subversion of the agricultural system of the South, and the wide spread financial ruin following the triumph of the destructive measures of the Black Republican faction. In the face of all these difficulties, and at the close of a bloody and desolating war, which expended its fury chiefly upon Virginia, the class of the University numbered two hundred and fifty-eight. Notwithstanding all their losses and deep distress, the Southern people have still left for them the development of perfection of their educational institutes. It has been said with truth that "man can not propose a higher or holier object for his study than education, all that pertains to education."
During the recent war, the dormitories of the University furnished comfortable hospital accommodations to hundreds, and we might say thousands, of the wounded of General T. J. (Stonewall) Jackson's army, during his celebrated campaign in the Valley of Virginia; and two of the Professors of the Medical School, J. L. Cabell, M. D., Professor of Comparative Anatomy, and Physiology, and Surgery, and J. S. Davis, M. D., Professor of Anatomy and Materia Medica, conducted one of the largest and best-ordered hospitals in the Southern Confederacy.

The amount of valuable material for clinical instruction, gathered by these learned and accomplished physicians, during their most efficient and untiring ministrations to the Confederate sick and wounded, must have been immense, and of incalculable value to the University.

At the present time, when we are reviving our institutions, the peculiar features of the Medical department of the University of Virginia are well worthy of the attention of the physicians of the Southern States.

"In nearly all the medical schools of this country, the usual length of the session is from four to five months. In order to embrace all the important branches of Medical science in a course of instruction compressed in so short a time, it is found necessary to employ the services of six or seven Professors, who deliver six lectures a day. Under this arrangement the student, if they take all the tickets, are required to spend nearly the whole day in listening to lectures, delivered in rapid succession, and treating of diverse topics. None but those who have had personal experience in this matter can fully appreciate the troubles and difficulties which beset a student when he first enters the school; the fatigue of body and perplexity of mind which he inevitably experiences in his painful efforts to hear every lecture and master every subject. In attempting, after the close of the lectures for the day, to bring in review the topics discussed by his teachers, he finds links in the chain, here and there, broken; he flies from one subject of thought to another without adequately mastering any, and confounded by their number, and the utter impossibility of keeping pace in his private reading at night with the lectures of six Professors, he
despairs of doing more than retaining such portion of the facts stated in the lectures as may happen to make the strongest impression on the mind.

In the Medical department of this Institution, the length of the session, which is nine months, enables four Professors to perform all the duties which are elsewhere assigned to six. The students attend but two lectures a day, and thus have ample time for private reading, and for pursuing their anatomical dissections. The supply of subjects is ample, and the Demonstrator devotes the whole of every afternoon to his duties. He guides the labors of those who are at work, and explains to them the structures which are successively exposed."

It is one of the peculiar advantages of the University Medical School, that it unites the plan of private instruction by private pupillage with that of public lectures; while the length of the session enables the Professors to pursue a philosophical order of studies, and thus to afford the students an opportunity of mastering the elementary branches before attention is directed to their practical application.

---

**ARTICLE VI.**


We have derived profit as well as pleasure from the perusal of the chapters of this valuable History of Florida, which are published weekly in the Florida Union, and we hope that the author will, at an early day, issue his labors in book form, and thus secure them from the accidents of time. A most interesting feature of this work is, that it embraces a wide field of study, and includes extended and careful descriptions of the climate, soil, and natural productions of Florida. We have always regarded such efforts at the South with great interest; and they are especially valuable at the close of a desolating war, in which some of the most valuable libraries of the South were either burned, destroyed, or "captured," and shipped out of the country.

In order to understand the theory of treatment of any disease, a knowledge of its pathological anatomy is absolutely essential. This fact is more often overlooked with regard to cholera, perhaps, than to any other disease, and for the very natural reason that no investigations in this direction have as yet thrown much light upon the subject. Still, to properly appreciate the numerous theories constantly brought forward, the results, both positive and negative, of the post mortem examinations should be present to the mind. To bring together facts scattered through many different treatises, has been the object of the present resume.

There are some few cases on record where patients have succumbed to the prodromic symptoms before the cholera proper had declared itself; but as there have been preserved none of the pathological changes, I shall pass at once to those recorded after death during the second period, or that of collapse.

In these cases, there is frequently a sudden elevation of temperature; invariably the body loses its heat, but slowly. The muscular spasms often continue to a more or less extent, and, in India, cases are reported in which the attendants have been forced to secure the limbs of the dead, so great was the moral effect upon the neighboring patients. The blueness of the face and members remains; the subcutaneous cellular tissue is dry; the muscles are dark colored and but slightly consistent (exceptional, Valleix). This bluish appearance is also noticed in the greater part of the spongy bones, and even to the roots and crowns of the teeth. The digestive canal is pale and discolored in places, but in general offers a dark color, due to the arrest of the blood. From the oesophagus to the rectum, but particularly at the end of the ileum and in the cæcum and colon, is often found an eruption of hard, opaque
bodies, about the size of the head of a pin, which are nothing more than the swollen follicles, such as are often found in other diseases where the serous exhalation is increased. The stomach and intestines contain a variable quantity of a flocculent liquid, sometimes acid, sometimes alkaline in reaction, and of an insipid odor. Most authors deny the presence of any bile, but Dr. J. C. Dalton and Niemeyer say that the bile is present, but recognized with difficulty, from its extreme dilution. In color this liquid varies from a greyish white to a chocolate, the darker being more common in the lower parts. Its nature is generally considered to be that of the serum of the blood, although Andral and Bouillaud consider it mucous, and Bouillaud attributes to it some specific qualities. The flocculi floating in it, as well as the creamy, greyish-white membranes with which parts of the entire digestive canal are covered, consist of epithetical scales in different stages of perfection. Valleix, Bouillaud, and several others have occasionally noticed in the gallbladder the presence of a liquid resembling that found in the intestines, while J. Brown has usually found it turgid with black blood. Virchow has signalized an enormous accumulation of fat in the villi of the intestines, a fact attributed to the ordinary occurrence of the attacks during the process of digestion, when the vessels are loaded with chyle. In other respects the biliary and lymphatic vessels are unaltered. The kidneys, particularly in their cortical substance, are engorged with black, diffuent blood, and a certain flaccidity of their tissue is noticed by Dr. Dalton, as well as a peculiar smell, resembling that of molasses, which is exhaled from their cut surface and replaces the ordinary renal odor. The liver is congested with black blood; the spleen is generally small and hard, while the other parenchymatous tissues are conoested and of a peculiar bluish color; the bladder, ordinarily empty and retracted, but occasionally containing a certain amount of altered mucus, exhibits on its internal surface membranous patches similar to those found in the digestive canal; the lungs are usually
collapsed, flabby, and hardly obstructed—rarely, however, there is extensive congestion, and apoplectic centres even have been found in them. Small patches of the whitish membrane spoken of in connection with the digestive canal are sometimes found in the bronchial tubes. The heart is small, flabby, and easily torn; the right ventricle filled with black, sticky blood, the left usually empty. Ecchymoses are sometimes found on the pericardium and on the endocardium of the left ventricle. The whole venous system is engorged with the same black, sticky blood, which coagulates very slowly and parts with but little if any of its serum. Upon exposure to the air, according to Rayer's investigations, it oxidizes more slowly than in its normal condition, owing to the absence of the saline substances which favor oxygenation. Schmidt found the oxygen diminished more than one half. The fibrin, albumen, and salts have been found deficient by most chemists, although Robertson, of Edinburgh, states that the fibrin is usually in large amount, and Andral that albumen is present in normal quantity. Becquerel concludes that the proportion of the globules is increased; the serum, less abundant and denser, contains an abnormally large proportion of extractive matters, salts, and particularly fatty matters. Microscopic examination has shown the globules normal in appearance, but Donné has remarked a certain viscosity, which prevents them from slipping easily in the liquid in which they swim. Dr. Parkes has observed that, in some cases, the addition of a few drops of the liquid taken from the intestine would restore the arterial color of the blood. The serous membranes are all more or less dry and sticky; the peritoneum particularly so; the cerebral and cerebrospinal vessels are more or less engorged; the cerebral substance is likely to be congested, and even the nerves and their ganglions may be in the same condition, although the nerve-tissue is never altered. The semilunar ganglion, thought by some authors to be the original seat of the disease, has been found normal by the majority of pathologists.
In subjects who have died in the period of reaction, there is less venous but more active and inflammatory congestion; the brain is dotted with puncta cruenta; the lungs are sometimes inflamed or hepatized; the blood is redder and contains more serum; the peculiar liquid has disappeared from the digestive canal; the serous membranes are moist; the agminated follicles are occasionally a little swollen, but without showing any of the characteristic appearances of typhoid fever; the bladder contains a variable quantity of urine.

Thus far the alterations given us by pathologists are: 1st, the general injection of the venous system, giving the peculiar color to nearly all the organs; 2d, the characteristic liquid found in the digestive canal; 3d, the absence or altered condition of the mucus in the different cavities which are lined by a mucous membrane; 4th, the development of the glands of the intestine—evidently most insufficient grounds for the basis of anything more than a purely speculative hypothesis.

NECROLOGICAL NOTICES.

James Hamilton Couper, of Glynn County, Georgia.

It was with feelings of deep sorrow, that we noticed in the secular papers the announcement of the death of the distinguished Naturalist, at his residence on St. Simon's island.

Mr. Couper occupied a distinguished position in science, and was, perhaps, more widely known in Europe than in Georgia, his native State. Many valuable contributions upon the Geology and Natural History of the Southern States, from his pen, have been published in the scientific journals; and he has been the generous donor of several splendid collections of fossil remains to the museums of Washington, Philadelphia, Charleston, and London.

In 1861, Mr. Couper presented his entire cabinet of Conchology and Palaeontology to the Museum of the Charleston College. This magnificent contribution added greatly to the interest of these
special departments, and stimulated many citizens to contribute rare specimens from their private cabinets.

Possessed of a large fortune, and endowed by nature with the highest social and intellectual qualities, Mr. Couper exerted a most extended and useful influence in the world of science, and attracted to himself the esteem and friendship of many of the most distinguished savans in America and Europe. The estimation in which he was held abroad, will be shown by the following extract from the travels in America of the distinguished English Geologist, Sir Charles Lyell.

"December 31st, 1845. At the end of a long day's sail, our steamer landed us safely at the village of Darien, on the sandy banks of the river Altamaha. * * The next morning, while we were standing on the river's bank, we were joined by Mr. Hamilton Couper, with whom I had corresponded on geological matters, and whom I have already mentioned as the donor of a splendid collection of fossil remains to the Museum at Washington, and, I may add, of other like treasures to that of Philadelphia. He came down the river to meet us in a long canoe, hollowed out of the trunk of a single cypress, and rowed by six negroes, who were singing loudly and keeping time to the stroke of their oars. He brought us a packet of letters from England, which had been sent to his house, a welcome new year's gift, and when we had glanced over their contents we entered the boat to ascend the Altamaha. * * About fifteen miles above Darien, on the opposite bank, we came to Hopeton, the residence of Mr. H. Couper, where we spent our time very agreeably for a fortnight. Much has been said in praise of the hospitality of the Southern planter, but they alone who have travelled in the Southern States can appreciate the perfect ease and politeness with which a stranger is made to feel himself at home—horses, carriages, boats, servants, are all at his disposal; even his little comforts thought of, and everything is done as heartily and naturally as if no obligation were conferred. When Northerners who are not very rich receive guests in the country, where domestic servants are few and expensive, they are often compelled, if they would ensure the comfort of their visitors, to perform menial offices themselves. * *
There is a warm and generous openness of character in the Southerners which mere wealth and a retinue of servants can not give; and they have often a dignity of manner, without stiffness, which is most agreeable. The landed proprietors here visit each other in the style of English country gentlemen, sometimes dining out with their families and returning at night, or, if the distance be great, remaining to sleep, and coming home the next morning.

"I found, in the well-stocked library of Mr. Couper, Audubon's Birds, Milhaud's Forest Trees, and other costly works on natural history; also, Catherwood's Antiquities of Central America, folio edition, in which the superior effect of the larger drawings of the monuments of Indian architecture struck me much, as compared to the reduced ones given in Stephens' Central America, by the same artist, although they are also very descriptive."

Dr. William Rushion, M. D.,

Died in New Orleans, after a brief illness, on the 21st day of November, 1862, at the age of fifty-four years.

He was born near Bolton, Lancashire, England, in 1808. He studied the profession of medicine in Edinburg, Scotland, and graduated at the famous school of that city in August, 1827. In order, however, to observe disease under the treatment of other leading lights of medical science, he repaired to London, and continued two years longer in the prosecution of his studies.

The first professional duties to which Dr. Rushtion devoted his services was the position as surgeon to one of the East India Company's ships to Calcutta. At the conclusion of this voyage, which occupied his attention for one year, he returned to England, and immediately sailed for New Orleans, and arriving in this city in 1832, he determined to make his home in the great emporium of the Southwest. After a residence of two years, he married Miss Elizabeth West, a daughter of an estimable family, and connected with many of the most highly refined and influential of our Creole population.
From the moment of the arrival of this young and enterprising stranger in this city he began a career of usefulness, and attained a degree of eminence as a practitioner rarely enjoyed by medical men: for he was affable in manner, intelligent in conversation, well versed in the practical details of a learned profession, possessed of energy and decision of character, and armed with these elements of success, he so speedily entwined himself around the hearts of our people, as to render his untimely loss a serious public calamity. Generous and warm-hearted, he assisted the needy with his bounty, entirely free from pride or ostentation. Taught by the pure waves and free winds that bore him to these shores to love freedom of speech and action, he became intimately identified with the manners, customs, and institutions of our people; and when political strife arose, he mingled his sorrows with his friends, and grieved with profound sympathy for the cause of those with whom he had passed a well-spent life, and who had saluted him, a stranger in a strange land, with kindness. His heart was a fountain of goodness and benevolence, and, going to his grave without an enemy, he “rests from his labors, and his works follow him.”

Though buried far away from the graves of his fathers, his bier was moistened by the tears of affection, and his memory will be long held dear by friends who saw within him the soul of honor and generosity. May God comfort the bereaved hearts of those within that home which knows him no more!—N. O. Medical and Surgical Journal.

Dr. Erasmus Darwin Fenner, M. D.,

Died in New Orleans on the 4th day of May, 1866. He did not long suffer the pangs of disease, for a short illness quickly severed the slender cords of life. Indeed, but few of our citizens were aware that this man of energy was feeble in strength, and that an abrupt period was about to terminate his career of public service.

Dr. Fenner was a native of Franklin, North Carolina. His father, who was a physician, educated him to the practice of the medical profession, and he first entered upon the arduous duties of his calling at Clinton, Mississippi. Seeking a wider field for
the exercise of his talents, he made his residence in this city in 1840. His first undertaking that directed public attention to his labors was the organization, in conjunction with Dr. A. Hester, of the *New Orleans Medical Journal*, which was begun in 1844, and from this effort originated the present *New Orleans Medical and Surgical Journal*. His next effort for good was the establishment of the “New Orleans School of Medicine,” and since the termination of our disastrous political strife, he interested himself in establishing the *Southern Journal of Medical Sciences*.

At all times ambitious of success, Dr. Fenner struggled to attain an enviable distinction among his fellows. In order to confer benefit upon his beloved section, he often attempted to penetrate the mysteries surrounding the origin and cause of the malignant febrile diseases of the Southwest. His efforts were constantly directed to the improvement of the sanitary condition of our city, and in the last paper given by him to the medical profession, the lamented author sums up his observations in regard to a question which is of present and paramount interest to the people of New Orleans. He is discussing epidemic diseases and quarantine, and says:

“All efforts hitherto made to prevent their extension by means of quarantine and sanitary cordons have failed, and we have but little reason to hope they will ever succeed. For twenty years we and some others have labored to convince the people of New Orleans that the only way to make the city healthy is to make and keep it clean. But we have labored in vain. In the mysterious course of events, the hand of the tyrant has been brought to our aid, and the results are marvelous. Will our citizens profit by this experience, and continue to enforce their health ordinances, as the Federal authorities enforced them? If they do not, the consequences will surely be deplorable.”

This is our lamented friend’s last professional will and testament to the people whom he loved so well, and of which, when reading them over on his bed of sickness, he said to his associate: “The future will prove these words to be true.”—*New Orleans Medical and Surgical Journal*. 
DISINFECTANTS AND HOW TO USE THEM.

[Advised by the Metropolitan Board of Health.]

(1.) *Quicklime*—to absorb moisture and putrid fluids—use fresh stone lime finely broken; sprinkle it on the place to be dried, and in damp rooms place a large number of plates filled with the lime powder. Whitewash with pure lime, and not with kalsomine.

(2.) *Charcoal powder*—to absorb putrid gases—the coal must be dry and fresh, and should be combined with *lime*: This compound is the "*calx powder*.

(3.) *Chloride of Lime*—to give off chlorine, to absorb putrid effluvia and to stop putrefaction: Use it as lime is used, and if in cellars or close rooms the *chlorine gas* is wanted, pour strong *vinegar* or diluted *sulphuric acid* upon your plates of chloride of lime occasionally, and add more of the chloride.

(4.) *Sulphate of Iron (Copperas)*—to disinfect the discharges from cholera patients and to purify privies and drains: Dissolve ten pounds of the copperas in a common pailful of water, and pour a quart or two of this strong solution into the privy, water-closet, or drain every hour, if cholera discharges have been thrown in those places; but for ordinary use, to keep privies and water-closets from becoming offensive, pour a pint of this solution into every water-closet, pan, or privy-seat every night and morning. Always sprinkle a cupful of chloride of lime or lime powder in the same place and at the same time. Bed-pans and chamber vessels are best disinfected in this way, by a spoonful of chloride of lime and a spoonful of the copperas solution.

(5.) *Permanganate of Potassa*—to be used in disinfecting clothing and towels from cholera and fever patients, during the night, or when such articles can not be instantly boiled. Throw the soiled articles immediately into a small tub of water in which there has been dissolved an ounce of the permanganate salt to every three or four gallons of water. A pint of "*Labarraque’s Solution of Chlorinated Soda*" may be used for the same purpose in the tub of water. Either of these solutions may be used in
cleansing the soiled parts of the body of sick or dead persons. May also be used in bed-pans, etc.

**PLACES THAT MUST BE DISINFECTED.**

(a.) For water-closets, use 4 and 3; for privies, use 4, 3 and 2; for bed-pans and close stools, use 3 and 4 or 5; for cellars, use 1, 2 and 3; for vaults and stables, use 1 and 2, or 3 and 4, or any of coal-tar powders.

(b.) For soiled clothing, bedding, and carpets—boil whatever can be boiled, if the articles have been soiled by cholera discharges. Use solution of chloride of lime or chlorinated soda, a quart of either solution to ten gallons of water, if the articles are coarse and their colors of no consequence; but on fine clothing, that has been soiled in cholera or fevers, use the disinfectants described under No. 5, in the list above.

(c.) For sick-rooms, use 1, 2, or 3; for bed-rooms, ventilate; for closets, cleanse and keep dry; for beds and bedding, ventilate frequently in the sun.

(d.) Finally: *Let fresh air and sunlight purify every place and thing they can reach*; open and dry your cellars and vaults; flush the water-closets and drains *daily* before throwing in the disinfectants as directed; let there be no neglect of domestic and personal cleanliness.

**CHOLERA.**

The Metropolitan Board of Health publish this simple statement, and beg the public to give to it their earnest attention:

Cholera is generally a preventable disease, and in its early stages can be arrested, if the habits be good. Study, therefore, temperance in eating and drinking: do not believe that alcoholic stimulants are useful in guarding you against an attack. Let the food be nutritious, and keep the digestive organs in a healthful condition. Use no stale or uncooked vegetables. Let your meet be fresh, and your vegetables be well cooked, and all fruits be fresh and ripe.

*Cleanliness of the body* is of the first consideration. Keep the skin in a healthy state by bathing the whole body, with a free use
of soap. Cold bathing is best used in the morning—never just before going to bed. Dry frictions or the warm bath may be more safely used just before going to bed.

Cleanness in your homes is of equal importance. Let your apartments be dry; never damp. Suffer no decayed vegetables or stagnant water to remain in your cellars or yards. Any disagreeable smell from privies, cess-pools, or sinks is a proof of their unhealthfulness. Remove them by necessary repairs, lime, chloride of lime, or whitewashing. Ventilate well your houses and apartments. Expose your bedding to the air and sun. Avoid excessive fatigue. Keep regular hours in eating and sleeping. Wear flannel next to the skin. A good plan is, if the bowels are at all disordered, to wear a broad band of flannel (a belly-band) around the body, reaching from the hips to the ribs. Maintain the natural temperature of the body by sufficient clothing; especially keep the feet warm. Never, when heated, sit on the grass or stone seats, or sleep under an open window. If exposed to wet, change your boots and clothes as soon as possible. Take no purgative medicines, except by direction of a physician.

By order of the Metropolitan Board of Health.

TREATMENT OF CHOLERA.

Cholera is almost invariably preceded by a painless diarrhoea, and in all cases to be promptly treated.

When diarrhoea is present, go to bed and maintain a position on the back; use abundance of blankets, and send for a physician.

A physician can always be obtained by applying to the nearest police-station.

Stay in bed until you are well; do not consider yourself well until you have had a natural movement from the bowels. Abstain from all drinks. Apply mustard plasters to the bowels.

In the absence of a physician, an adult can take ten drops of laudanum and ten drops of spirits of camphor. A child of ten years may take five drops of laudanum and five of camphor. A child of five years may take three drops of laudanum and three of spirits of camphor; and these doses
may be repeated every twenty minutes, so long as diarrhœa, or
pain, or vomiting continues.

This will save time, but in all cases send for a physician.

Do not get up to pass the evacuations, but use the bed-pan or
other conveniences. Never chill the surface of the body by
getting out of bed.

Remove immediately all the evacuations from your rooms.
Scald all the utensils used, or disinfect them with chloride of
lime; scald also your soiled clothing.

By order of the Metropolitan Board of Health.

Medical Diagnosis with special reference to Practical Medicine. A
guide to the knowledge and discrimination of diseases. By I.
M. DaCosta, M. D., Lecturer on Clinical Medicine, and
Physician to the Pennsylvania Hospital, etc., etc. Illustrated
B. Lippincott & Co. 1866. 8vo. pp. 784.

The author tells that his chief aim in writing this work has
been to furnish advanced students and young graduates of medi-
cine with a guide that might be of service to them in their
endeavors to discriminate disease. He has accomplished his task
with decided ability, and his book can not fail to be eminently
useful, especially in this country, where so little attention is
usually given to the study of diagnosis. A clear perception
of the real condition of the system and of each organ is an
essential pre-requisite to correct prescription, and too much
attention can not be bestowed upon the study of the means
by which this knowledge may be attained. We, therefore,
commend Dr. DaCosta's treatise especially to the junior members
of the profession.

BOOKS AND JOURNALS RECEIVED.

Braithwaite's Retrospect of Practical Medicine and Surgery. New York,
W. A. Townsend, 434 Broome street; Part LIII: July, 1866.
The American Journal of the Medical Sciences. Edited by Isaac Hays,
M. D., Philadelphia; Henry C. Lea: July, 1866.
The Medical Reporter, a Semi-Monthly Record of Medicine and Surgery.
Edited by J. S. B. Alleyn, M. D., and O. F. Potter, M. D., St. Louis;
March to July, 1866.
The New Orleans Medical and Surgical Journal. Edited by Warren
Stone, M. D., James Jones, M. D., S. E. Chaille, M. D., and W. C.
Nichols, M. D.: July, 1866.
Southern Journal of the Medical Sciences. Edited by Warren Brickwell,
M. D., and C. Beard, M. D.: May, 1866.
Illustration of Diseases with the Microscope. Prize Essay. By Francis
Peyre Porcher, M. D. Published by the South Carolina Medical Asso-