From numerous inquiries that have been made of me regarding my microscopic examination of the specimens removed from General Grant's throat, and from the great interest manifested in his case, I have consented to place before the medical profession this data upon which the diagnosis rested.

When the importance of using the microscope to determine the exact nature of the malady became apparent, I was invited by Dr. J. H. Douglas to assist him, and he then sent me some scrapings from the surface of the sore on the right posterior pillar of the fauces. These little particles I carefully prepared in the usual way and examined with the microscope. Little, however, of definite value could be made out, because the specimens had, unfortunately, been allowed to dry up before they came into my possession. They were consequently useless for purposes of microscopic examination.

On the morning of February 18, 1885, the importance of a further and more satisfactory investigation was suggested to General Grant, and the necessity of removing a small piece of the diseased tissue for that purpose was made known to him. Consent was readily obtained. I was then permitted to see the extent of the gross lesion, and was furnished with a history of its development.

The description given in *The Medical Record* on March 7, 1885, of the site and extent of the disease, corresponds with my recollections of the accounts that I received at that time. As there stated, the area of disease was not great, and the pillars of the fauces on the right side were the parts most involved, the adjoining side of the tongue being indurated to a slight extent only.

Preliminary to cutting off any of the diseased tissue the throat was sprayed with a four per cent solution of the hydrochlorate of cocaine, which allayed, to a great extent, the irritability of the affected tissue. A piece about as large as a small pea was then removed by Dr. F. C. Riley, from the ulcerated edge of the posterior pillar of the fauces. The removal took but a moment, and gave the patient little discomfort. The specimen was placed at once in alcohol and water, equal parts, for the purpose of hardening it. After immersion for twenty-four hours, the specimen was transferred to absolute alcohol, in which it was kept for twenty-four hours longer, when it was found possible to make thin sections. The latter were stained, in order to bring out more clearly the minute component parts. The staining reagents used were haematoxylon, Bismarck brown, and haemotoxylin and eosine. Subsequently these sections were mounted on glass slides in Canada balsam.

I found that the tissue examined was composed largely of epithelial elements, grouped frequently under the form of distinct lobules. The cells forming these lobules lay in close contact, and showed a marked tendency to be arranged in concentric globes or "nests." This latter arrangement of epithelia is characteristic of that form of cancer known as the epithelioma.
Most of the globes were found to be in an early stage of formation. I do not wish to be understood as basing my diagnosis of epithelial cancer upon these globes or nests only, but in connection with other pathological and clinical data I regard their presence as highly significant.

Marked multiformity in the shape of the epithelial elements was another of the important findings in the specimens under examination, while distinct evidences of cell proliferation were seen in the Malpighian layer. By the lobulated appearance of the epithelial mass referred to above is indicated a tendency of the new cell-formation to burrow into the deeper parts of the underlying tissue. Extravasations of blood were also found among the epithelia. This condition I regard as pointing to a low vitality of the newly developing growth, and cell dissolution, leading to rupture of the capillary blood-channels, by which their contents escape into the surrounding tissue. Finally, in some parts of the diseased tissue a fibrous framework was found.

By way of summary, then, the more or less lobulated appearance of the epithelial mass; the actual existence of some "cell-nests;" the great diversity in the shape of the cell elements; the marked evidences of epithelial proliferation, and the peculiar appearance of the stroma, warrant the diagnosis of epithelioma of the squamous variety.

This conclusion has been arrived at, after the greatest possible care had been taken to exclude all possibilities of error; after an exhaustive study of every detail, with a knowledge of the clinical history of the case, and this, too, with a mind anxious only to find microscopical evidence that the disease was of a benign or innocent nature.

Since sending in a my first report I have shown the specimens to Dr. T. E. Satterthwaite, the well-known pathologist, and he fully corroborates my diagnosis. I have also, upon request, shown the same specimens to Drs. Fordyce Barker and J. H. Douglas, the eminent gentlemen in charge of the case, and to Drs. Henry B. Sands and George F. Shrady, the consulting surgeons, all of whom appreciated the significance of the appearances, and expressed themselves accordingly.

In conclusion I may say that this case illustrates the peculiar value of the microscope as an aid in diagnosis, since without it a positive conclusion could not have been reached upon the exact nature of the disease. In many instances, it is true, we cannot be so positive, either because we are not fortunate enough to obtain the particular part of the diseased tissue that shows the characteristic structure upon which the diagnosis is made with the microscope, or it may be that the disease is at that early stage, when it exhibits nothing that is pathognomonic.

The great interest of this case, not only to the medical world, but to the public at large, has induced me to describe in some detail the examination of a specimen that exhibits nothing but what is constantly found in an epithelioma of ordinary type that is fully developed.

August 12, 2002