THE AMERICAN CHEMICAL SOCIETY.

The October meeting of the American Chemical Society was held Friday evening, the 7th inst., with Dr. A. R. Leeds in the chair. The following new members were declared elected: H. C. Heipe, Wm. L. Leman, Dr. H. Von Bauer, Lewis Habel, Dr. Lauber, Dr. P. Radenhauser, and Mr. A. L. Colby. The first paper announced was by Prof. Leeds "On the Comparative Purity of City Water." In consideration of the recent litigation in regard to the pollution of the water of the Passaic river, Prof. Leeds was appointed to investigate the purity of the water from a chemical standpoint. The water supply of the cities of Newark, Jersey City and Hoboken is taken from the above mentioned river. Before it reaches Newark, the sewerage of Paterson, a city of 50,000 inhabitants, is emptied into it: besides this, along the river, the stream receives the refuse from a number of factories.

A short distance beyond Paterson, at a paper mill where carbolized paper was manufactured, the entire refuse was dumped into the river. In consequence of the dissolving of the carbolic acid, its presence was soon detected at Jersey City and Hoboken, and it became so objectionable that the water could not be used for drinking purposes. Legal measures were at once adopted, and the nuisance stopped. Simultaneous collection of specimens of the drinking water of the leading cities of the United States were collected, and a comparative examination of the organic matter (estimated according to the permanganate method) undertaken. Without any other special reference to the data given by Prof. Leeds, his results were as follows:—

The purity of drinking water:—

1, Brooklyn; 2, Rochester; 3, Philadelphia; 4, Baltimore; 5, New York; 6, Washington; 7, Newark, Jersey City and Hoboken; 8, Cincinnati; 9, Boston; 10, Oswego; 11, Wilmington, Del.

In answer to questions which arose during the discussion of the paper, it was stated that during the past summer an excessive amount of chlorine was found in the analysis of the Passaic river, a fact contrary to all previous experience, and one which was considered as due to the extreme drought of the past summer so diminishing the amount of fresh water that the sea water had extended quite a ways back up the river. A similar circumstance was stated in regard to the Hudson river this year, the salt water being detected higher than usual. In regard to the statements recently made by Prof. Huxley in reference to the spread of disease by germs in the water, a very significant fact was mentioned by Prof. Leeds, in commenting on the rags used in the paper mills, who stated that they were imported from the plague stricken regions of Smyrna, and yet not one case of analogous disease had been observed from those who used the water, in which these rags were cleansed, for drinking purposes. The desirable property of precipitating out organic material from water by the use of the basic chloride of iron was remarked by Dr. E. R. Squibb. This fact has been used to advantage by one of the large hotels at Coney Island.

"Upon some new Salts of Thymole Sulpho Acid, and some new facts concerning the same," was the title of the second paper. It was by Mr. James H. Stebbins, Jr., and was essentially a resumé of some recent salts prepared by him and description of their important characteristics.

The third paper was by Dr. W. Hempel, who gave in the German language a descriptive "Exhibition of some new Gas Apparatus." Not only were they exhibited, but Dr. Hempel, in the presence of the Society, made analysis of the illuminating gas (which he considers superior to that used in Europe) and of the air. To those who are especially interested in this branch his recently published book will give the requisite information, and for the average reader a general description is almost impossible without cuts.

M. B.

MOUNDBUILDER SKELETONS.*

I.

By W. C. Holbrook, Coleta, Ill.

The skeletons found in the mounds of Rock River Valley, although always partially decomposed, present the following anatomical peculiarities:—

The *cranium* is small, low and broad. The superciliary ridges are very large and cause the forehead to appear even lower than it really is.

The malar process and the zygoma small and low.

Traces of a *frontal suture* are sometimes found in adult skulls. In the skull of a child about six years old, the suture was well developed. It appears that the two lateral portions of the frontal bone did not then unite as early in life as they now do, and that the traces of this suture remained through life in some persons. In one adult skull I found ten bones, viz.: two occipital, two parietal, two frontal, two temporal, sphenoid and ethnoid. The occipital was divided into two lateral portions by an *occipital suture*.

The *frontal suture* was also well developed. The *sagittal suture*, therefore, extended from the glabella over the vertex to the *foramen magnum*.

The *sagittal suture* is usually quite short. In one skull it measured only 4 67-100 inches, and the frontal and the occipital bones in this specimen were normal.

The supraorbital foramen is usually large and about one-eighth of an inch above the orbit. I never saw a supraorbital notch in a moundbuilder skull. *Ossa triquetra* are very uncommon and are confined to the lambdoid suture. This suture, together with traces of an occipital suture sometimes form one or two large triangular *ossa triquetra* in the superior angle of the occipital bone.

The posterior half of the synamus suture is often completely grown up and the adjacent part of the temporal and parietal bones completely united.

The grooves for the *arterie menigea media* are very deep, while the foresæ that correspond to the brain are shallow and indistinct. The frontal sinus large and triangular in shape. The lower joint was large, massive and broad. The teeth are usual remarkably sound. I have never found but two or three "decayed teeth" in all of my explorations. Toothache was not, therefore, one of the troubles that beset the moundbuilders.

The humerus presents one marked peculiarity. About midway between the external and the internal condyloid ridges, and in the center of the fossa for the coronoid process of the ulwa, there is sometimes a well developed foramen.

In some mounds that contained fifteen or twenty persons this foramen was found in more than fifty per cent. of the humeri. I sometimes found it in both the right and the left arms. When only present in one arm, traces of an obliterate or grown up foramen were sometimes found in the opposite arm. Traces of this foramen are quite frequent, and in all moundbuilder humeri, the flat portion of bone between the condyloid ridges are very thin. This foramen is usually small and circular. Sometimes, however, it is large and triangular in shape, the base of the triangle parallel with the trochlea and the sides parallel with the condyloid ridges. A nutritious foramen sometimes enters the lower end of the shaft of the humerus at the superior angle of this triangular foramen. I believe that the moundbuilders were slowly outgrowing this Simian characteristic, for the humeri containing the triangular foramens are found in the oldest mounds, and are associated with the lowest foreheads and the smallest crania. In both the right and the left humerus of the skeleton whose skull contained ten bones, I found this foramen well developed. In the more modern mounds this foramen is less frequently found, and when present, is small and circular. The

* American Association for the Advancement of Science, 1881.

partition of bone between the two fossæ is also thicker.

The elimination of this "degraded affinity" is but one instance of the general evolution that has shaped or moulded all of the innumerable forms of animal and vegetable life. The vertebral column is always so badly decayed that anatomical comparison is impossible. The parts that "resist decay" indicate great physical perfection and strength. The Sacrum presents different forms in respect to curvature. Sometimes it is very slight, while in other specimens it is considerable. This curvature of the Sacrum is a more constant sexual characteristic in mound-builder skeletons than in the Caucasian or the African races, but I have not examined specimens enough to tabulate the difference. The only constant sexual characteristic of the Sacrum among all races of men is its greater breadth in the female, and this characteristic is well developed in the mound-builder skeletons. Comparing portions of almost every one of the larger bones of the mound-builder skeletons with several Caucasian and one Negro, and two Indian skeletons, it is certain that the primitive people of the Rock River Valley were strong, broad-shouldered, muscular men, with broad, round faces, and low receding foreheads. Exostosis, or foreign growth of bone, has been found. One, I remember, was found in one of the mounds near Sterling, Illinois. The foreign growth of bone in this specimen was stratified—deposited on the surface of the bone, in thin layers, like the layers in stalagmite. Bones exhumed from a mound on the west bank of Rock River, near Como, were very brittle, of a light and beautiful purplish color, when recently broken, and contained no animal matter. They resemble, in every respect, the bones exhumed from the church-yard of Ste. Genevieve, Paris, after a burial of over seven hundred years.—(Orfila Exhumations juridiques, Vol. I., p. 350.)

WHITE CORPUSCLES OF THE BLOOD.

The London *Lancet* draws attention to an interesting memoir on the White Corpuscles of the Blood, which appears in the part just issued of the *Archives de Physiologie*, in which M. Renaut describes the different forms presented by the white corpuscles in different animals. In the river crayfish, for example, besides the ordinary lymph-corpuscles, there are many larger bodies with well defined nuclei, the protoplasm of which contains large highly refracting granules, resembling in many respects the vitelline granules of the frog and other batrachia. These corpuscles have a sharply limited but thin exoplastic pellicle; and if a drop of such lymph be allowed to fall into a drop of a one per cent. solution of osmic acid, the white corpuscles are instantly fixed, with their pseudopodia or protoplasmic processes extended; and these processes can then be seen to perforate the thin membrane, now blackened with the acid. There are thus two kinds of white corpuscles in the decapod crustacea—the lymphoid corpuscles and the amœboid corpuscles. Do similar differences exist in the blood of vertebrata? In reply to this, M. Renaut states that in the blood of all the vertebrata, from the cyclostome to the saurians, the white corpuscles are of two kinds; one, the ordinary white corpuscle, composed of hyaline protoplasm, presenting many short projecting points, with a nucleus undergoing gemmation and sending forth branched pseudopodia when placed under favorable conditions; the other containing numerous brilliant granules embedded in the protoplasm and surrounding the nucleus. These resemble the second form of corpucle described above as existing in the lymph of the river crayfish, but differ from them in having no outer limiting layer of condensed protoplasm, or exoplasm, as Haeckel has named it. The application of osmic acid shows that they may be subdivided into two other forms: one closely analogous to cells undergoing transformation into fat-cells, which present numerous granules, and stain black with osmic acid, and another set which contains granules that are not fatty, but which stain red with eosine. The best mode of demonstrating the existence of these three forms is to fix the blood in the rete mirabile of the capillary of the choroid in the posterior segment of the eye of a frog, by removing the anterior segment and exposing it to the vapor of osmic acid. At the expiration of twelve hours the eye is removed from the vapor, washed, the chorio-capillaris detached from the retina, and spread on glass; it is afterwards colored with, and mounted in, hæmatoxylate of eosine. The corpuscles may then be studied, and the three forms of ordinary, granular, and fatty corpuscles can be easily distinguished. M. Renaut finds that the white corpuscles of mammals generally, and of man in a state of health, all closely resemble each other, and are of the ordinary kind; but in disease, as in leucocythæmia, the white corpuscles are not only greatly increased in number, but vary considerably in size. Moreover, they are round, and present no pseudopodia. They are hyaline, and have a smooth, well defined limiting membrane, and some of them have nuclei which have undergone fission, just as in a cell that is about to segment. Hence, he is of the opinion that the white corpuscles multiply and increase in number whilst floating in the blood; other corpuscles may be observed, which are charged with granules of some proteid substance, resembling vitelline granules, or small masses of hæmoglobin; and, lastly, there are still other cells, which are charged with fat. M. Renaut has made some observations on the development of the red corpuscles of the lamprey, and gives the following succession of forms:—White corpuscle with nucleus proliferating, and protoplasm, not limited by an exoplasmic layer; corpuscle with nucleus proliferating, the protoplasm forming an uncolored disc, limited by an exoplasm; corpuscle with proliferating nucleus, protoplasm limited by an exoplasm, and forming a disc, more or less charged with hæmoglobin; red corpuscle with proliferating nucleus; and, finally, circular red corpuscle, with rounded nucleus.

MICROSCOPY.

It has been decided by the Executive Committee of the American Society of Microscopists to convene the next annual meeting of the Society at Elmira, N. Y., August 17, 1882, at 10 A.M. It is thought that there will be papers and discussions enough at Elmira to occupy us four days; thus, by adjourning Friday evening, August 20, or Saturday noon, August 21, there will be ample time—for those who wish to do so—to reach Montreal in time for the meeting of the A. A. A. of Science on Tuesday, August 24.

At the Columbus meeting Mr. E. H. Griffith, of Fairport, N. Y., a member of Executive Committee of this Society, renewed his generous offer of a prize of a Bausch & Lomb half-inch objection of 98° air angle (about 0.76 numerical aperture), to be awarded as follows:

"The prize shall be assigned to the author of the best paper on the adulteration of some important article of food or medicine. The paper shall be accompanied by permanently mounted slides, illustrating the various points under discussion; all papers and slides to become the property of the Society. The papers and accompanying studies to be in the possession of the President on the first day of the next annual meeting. He shall appoint a committee of three to examine the same, and report the name of the successful candidate before the close of the meeting. The names of the competitors shall not be made known to any member of the committee until after the award is made. The award shall not be made unless there shall be more than one competitor."

In order to carry out Mr. Griffith's instructions the following rules are established: