secured by wires or twine to hold them in place until dry. Great pains were taken in inserting the eyes, — made from a color-sketch of the originals, — and marking in their surrounding lines, on which depended the expression of the face. After thoroughly drying, all seams were filled with *papier-maché*, while a slight but careful use of color restored the skin to its original aspect (fig. 4).

Thus was Mungo reconstructed, and thus did Mr. Hornaday successfully solve the problem of so mounting an elephant that his hide should appear loose and wrinkled, instead of, as is too often the case, smooth and swollen. Mungo was exhibited at the Washington meeting of the Society of American taxidermists, and received the special medal 'for the best piece in the entire exhibition.' This elephant may be said to represent the beginning of the new and better class of taxidermy at the national museum; and although four years ago he stood, as regards quality, almost isolated, he is to-day surrounded by so many pieces of equal merit that we may look hopefully forward to the time when the mounted mammals of the national museum shall be unsurpassed.

FREDERIC A. LUCAS.

A FEW WORDS ABOUT PAVEMENTS.

A RECENT report to the commissioners of accounts of this city, prepared by Col. George T. Balch, and relating to a pavement now being laid in Fifth Avenue, shows clearly the difference between pavements scientifically constructed and those with which New-Yorkers are more familiar. The value of the report is enhanced by the judicious use of engravings, some of which are reproduced herewith. Fig. 1 is a transverse section through a pavement constructed in accordance with the specifications prepared by the city authorities. The agreement between the city and the contractor called for sound granite blocks, approximately uniform in size, rammed solidly down upon a bed of sharp, clean, dry sand; the spaces between the blocks to be filled with clean, dry, hard gravel, free from sand, over and through which should be poured hot coal-tar cement. The sand bedding was to rest upon a concrete foundation at least six inches thick, laid upon a well-tamped road-bed. Were the provisions of the agreement carried out, Fifth Avenue would have a pavement nearly perfect of its kind. But, according to Colonel Balch's report, nearly every

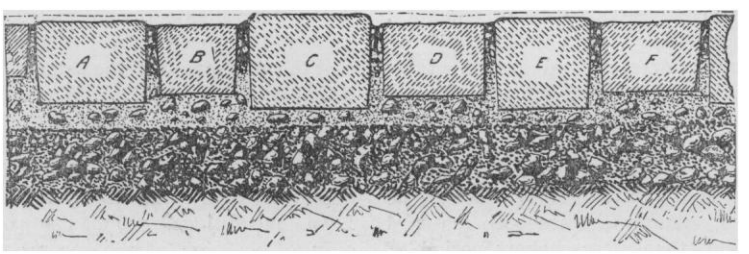

FIG. 3. — PAVEMENT AFTER HEAVY TRAFFIC.

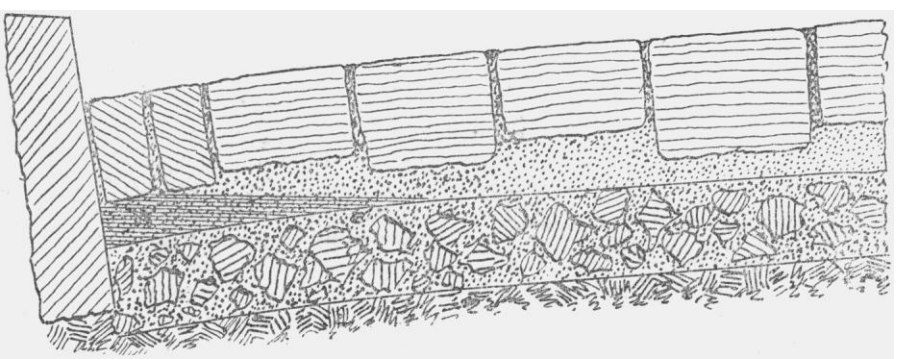

FIG. 4. — EFFECTS OF WET SAND AND LEAKAGE.

provision of the agreement has been violated, and the result is a pavement such as shown in transverse section in fig. 2. The road-bed, or subgrade of earth, was not excavated to the proper depth, leaving the surface of the pavement at the centre of the street three inches higher than the established grade, making a steepness of crown or arch between curbs detrimental to traffic as compared with a flatter surface, and actually dangerous in icy weather. The surface of the road-bed was not tamped; the concrete ranges in thickness from the stipulated six inches down to three, and in some places even two inches; it was not properly mixed, laid, or tamped; and the materials of which it is composed are inferior in quality. The granite blocks vary greatly in size, and are bedded in a mixture of sand and gravel. They are laid with the broadest edge upward, instead of the reverse; the filling between them is a mixture of sand and gravel; and the paving cement, instead of filling the interstices to the bottom of the block, extends only an inch or two below the surface. In fact, so imperfect are both material and workmanship, that, after a short period of heavy traffic, the pavement will present the appearance shown in fig. 3. All sand and gravel used should have been free from moisture, artificially dried if necessary, and the joints between the blocks should be water-tight. These conditions were violated, and the collection of water at *W* in fig. 4 shows the effect of damp bedding and leaking joints. As a result, the tremendous pressure due to the expansive force of the freezing of this water in cold weather may be expected to rupture the pavement at the point where the water collects.

ST. PETERSBURG LETTER.

RUSSIAN science has sustained a heavy loss by the death of A. M. Butlerow, the celebrated chemist, in August last: it is the greater, as he was yet in the prime of life. His chemical work is well known abroad, but it may not be known that he had a second specialty: he was an eminent apiculturist. The progress in bee-keeping made in the last years in Russia owes much to his untiring efforts, especially to his manuals and papers. By his death the second chemical seat is made vacant in the Academy of sciences; and various surmises are made as to whether this learned corporation will persist in its opposition to the election of the greatest of Russian chemists, Professor Mindeleff.

Professor Mindeleff has twice visited the petroleum district near Baku, on a mission of the Ministry of finance, principally with a view to ascertaining if the wells were rapidly giving out or not. He has not yet returned from his last journey. Great progress is said to have been made in the distillation of petroleum oils by G. W. Alexeyew.

It being now early in the season, news about geographical expeditions is yet scarce. Prjevalsky is still at his country-seat, working at the report of his last journey, which is to be ready in August next. The special reports on botany, different parts of zoölogy, and probably also geology, it will take a long time to complete. The only special report which is to appear sooner is that on meteorology. The observations during the last expedition will be printed *in extenso*, together with those made during the Lob-Nor and the second Tibet expeditions of the same traveller, and the itineraries of the same. The work is to be supervised by Prof. A. Woeikof, who will add to it a work on the climate of the countries traversed, and High Asia in general.

The Russian polar commission has printed the observations of the first year (1882–83) of the Lena expeditions, which comprise meteorology only. The work of the second year, as well as the calculation of the magnetical observations, is in preparation. The work of the Lena expedition is of the highest character, and does the greater honor to its members, as it was done under the most serious difficulties.

Great progress in meteorological work in the south of Russia has been made. Professor Klossowsky, in Odessa, has succeeded in establishing quite a number of rainfall and thunder-storm stations in the government of Kherson, one of the most extensive in the south, and will issue a monthly report. This year was remarkable for heavy rains, especially in the southern part of the government. The rains have also extended to the central and eastern parts of Russia, and seldom have so heavy rainfalls been experienced on one day in this country. Till this year, over one hundred millimetres fell on one day at but two places in the plains of European Russia, — 145 in the southern part of the government of Tula, July 12, 1882; and over 120 at Yelisavetgrad. This summer we had 132 at Kharkow, June 24; 102 at Lgow (government of Koorsk), July 30–31 (of these, 51 in one hour); 99 at Moscow, Aug. 9–10; 93 at Kamishin, July 28. The rain of Aug. 9–10 was very heavy over a great district, and caused high water in the right tributaries of the Moskwa and Oka. The railroad-bridge over the Lopassnja was washed away.

Captain Makarow, I.R.N., has published an important work, "On the interchange of waters of the Black and Mediterranean seas." By the use of an instrument called a 'fluctometer,'