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Contents.

(Illustrated articles are marked with an asterisk.)

Table listing various articles such as 'Accident, a curious', 'Altitudes, statistics of', 'Archaeological news, recent', etc., with corresponding page numbers.

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Detailed table of contents for the supplement, listing sections like 'ARCHAEOLOGY', 'BIOGRAPHY', 'BOTANY AND HORTICULTURE', etc., with page numbers.

OUR FIFTIETH ANNIVERSARY NUMBER.

After the work and anxiety of getting out a special anniversary number, it is with genuine pleasure that we are able to record its very favorable reception by our subscribers and readers.

We will assume that all the editorial work has been completed; and that the proof sheets have been please with their final corrections in the printer's hands.

For the work of printing, three separate establishments were employed, and eighteen presses were set in motion. For two long weeks, day and night without intermission, the paper was fed to the machines and the services of over a hundred men were required to keep the work going.

It required 78 1/2 tons of paper to print this edition. Expressed in such terms this looks like a very large amount; but a more impressive idea of the amount of material handled is gained when it is expressed in terms of length. Eight pages of press matter constitute a form, and these eight pages are printed at one revolution of the press on a sheet of paper nearly four feet in width.

When the printing and binding are both completed, the mere task of mailing is far greater than our readers would commonly suppose. One day's mailing alone amounted to over eleven tons in weight, and filled two hundred and sixty mail sacks of the larger size.

Among other metropolitan contemporaries that have extended their fraternal greeting, the New York Sun welcomes the SCIENTIFIC AMERICAN anniversary number with its "articles on the various chief subjects of inventive thought by competent writers"

The New York World, in noting the attainment by the SCIENTIFIC AMERICAN of its fiftieth anniversary, speaks of the special number as a "remarkable presentation. . . The mechanical 'victories,' whether of peace or war, are minutely set forth, making this a number which will be preserved by every person into whose hands it falls."

Mr. William Baxter, Jr., the well-known electrical expert, writes: "I must say that your special number surprised me. I expected that it would be unusually large and very attractive in its get-up, and also that the reading matter would be of the highest order; but the amount of interesting historical information it contains, as well as the manner in which it is presented, is far beyond my expectations."

We also beg to draw the attention of our readers to the fact that a kind of supplementary continuation of the special number will be found in the current issue of the SCIENTIFIC AMERICAN SUPPLEMENT, where the text of the first of the five essays that stood next to the prize winner will be found. It is from the pen of Mr. Edmund Becker, of Washington, D. C., and to the interest which attaches to a subject thoughtfully handled and forcefully expressed, it adds a strong charm of novelty, inasmuch as it is written in the colloquial style, and is entitled, "1846 has an Hour's Chat with 1896."

The essay is racy, readable and highly creditable to its author.

THE NEW PLAN OF THE RAPID TRANSIT COMMISSION OF NEW YORK CITY.

The provision of rapid transit for New York City has an interest which extends beyond the limits of the city itself. The peculiar nature of the site upon which the city is built—a narrow and long-drawn-out peninsula, with its great business center located at its extreme end—renders the transportation problem one of more than ordinary difficulty, and its solution is being watched with great interest by the country at large, and particularly by all municipal engineers.

the 16th ult., was marked by two important events: the statement by Mr. Gould of the latest scheme of extension of the Manhattan elevated roads, and the presentation of an amended plan for an underground tunnel by the chief engineer of the commission. The proposals of the Manhattan Company may be dismissed with the announcement that the much talked of extension of the system into the annexed districts north of the Harlem River has dwindled down to a proposal to build certain surface trolley lines to connect with the present elevated system, and that this poverty-stricken proposal is saddled with a demand that such roads, if built, shall be guaranteed against all claims for land damages.

The new plans have been prepared so that they shall be in conformity with the requirements of the law and the late ruling of the appellate justices, and, at the same time, avoid any conflicts with the interests, real or supposed, of the property owners. The main objections urged against the Broadway tunnel scheme were the cost, the invasion of the rights of property owners on Broadway, the interruption to traffic, and the fact that it involved subsurface travel. It will be seen from the extract from Mr. Parsons' report, given below, that the first three objections are removed by the adoption of the Elm Street route. There will be no interference with property owners, inasmuch as Elm Street is about to be opened through to Center Street and the City Hall Park, and the buildings on either side will be torn down, so that it can be widened. These improvements and the construction of the tunnel could be carried out simultaneously. The estimated cost—\$26,500,000—is only 50 per cent of the total expenditure allowed by the law, and to those who object to underground travel it must be said that, judging from the events of the past few months, it begins to look as though the public would have to choose between a tunnel and nothing.

The report says: "I suggest a route commencing at the southwest corner of City Hall Park, with a station on Broadway. Thence with a two-track loop around the park, merging into one four-track road at Brooklyn Bridge. Thence northerly with four tracks under Elm Street and Fourth Avenue to Forty-second Street. Thence diverging with one two-track road under Forty-second Street to Broadway and under Broadway and the Boulevard to One Hundred and Thirty-fifth Street.

"Also an east side route to have one two-track road commencing at the junction at Forty-second Street and through and along Fourth Avenue and across the Harlem River, as proposed in the previous plans, or a route diverging from Fourth Avenue to the west at about One Hundred and Tenth Street, and running northerly across private property to the Harlem River.

"On the east sideline, north of One Hundred and Tenth Street, and on the west side line north of Forty-second Street, I suggest the construction of a third track for a distance of about one mile on each route. These third tracks would be used as express tracks for south-bound trains in the morning and north-bound trains in the afternoon. South of Forty-second Street two of the four tracks would, of course, be devoted to the express trains.

"I estimate that such a system can be constructed for \$21,000,000 exclusive of right of way. But to allow for unforeseen and not estimated contingencies, I prefer to add percentages varying from 20 to 40 per cent, according to the several sections of the work, which percentages aggregate the very liberal figure of \$5,500,000, making a total of \$26,500,000. A two-track elevated railroad north of the Harlem River, if built, will cost about \$350,000 per mile.

"The physical capacity of such a system for carrying passengers would be as great as that of the system at first designed by the board."

In making this estimate, the prices of the Board of Experts, Messrs. Hewitt, Chanute, Clarke, SooySmith and Burr, are used; and Mr. Parsons says that the cost of the recent tunnel work in Boston shows that these prices are very liberal, and that it is probable the work can be done for much less.

Regarding the speed of express trains, it is expected to make forty miles an hour, including stops. This is not too high an estimate. It was conceded by the opposition to the Broadway scheme that a speed of thirty-five miles an hour could be realized, and in view of the subsequent and continual improvement which is going on in motors and in methods of transmission, it is likely that by the time the scheme is completed—estimated at two years from the commencement of work—this speed can be reached or even exceeded.

It is estimated that the Pan-American railway to the southern extremity of South America would extend about 4,500 miles and cost \$180,000,000.