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NEW YORK, SATURDAY, MAY 9, 1891.

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Table listing sections I through XII, including Decorative Art, Electricity, Law, Mathematics, Meteorology, Naval Engineering, Paleontology, Photography, Physics, Railroad Engineering, and Sociology.

OUR URBAN POPULATION.

Mr. Robert P. Porter, Superintendent of the Census, has lately issued a bulletin relating to urban population, prepared under the direction of Mr. William C. Hunt.

In the published records of former censuses, urban population has been defined as that element living in cities, or other closely aggregated bodies of population, containing 8,000 inhabitants or more. This definition of the urban element, although a somewhat arbitrary one, is used in the present discussion of the results of the Eleventh Census in order that they may be compared directly with those of earlier censuses.

In 1880 there was but one city, New York, which had a population in excess of a million. In 1890 there were three, New York, Chicago, and Philadelphia.

In 1870 there were but fourteen cities each containing more than 100,000 inhabitants. In 1880 this number had increased to twenty, and in 1890 to twenty-eight.

The rate of growth of some of the cities is surprising. From the 443 cities having over 8,000, we select those that have increased by more than 75 per cent, and they number more than 100. It will be seen that Spokane Falls "takes the cake."

Table showing population growth of various cities from 1880 to 1890, including Alameda, Cal; Alpena, Mich; Amesbury, Mass; Amsterdam, N. Y; Anderson, Ind; Anniston, Ala; Arkansas City, Kans; Asheville, N. C; Ashland, Wis; Ashtabula, Ohio; Atlanta, Ga; Atlantic City, N. J; Battle Creek, Mich; Bayonne, N. J; Beatrice, Neb; Beaver Falls, Pa; Binghamton, N. Y; Birmingham, Ala; Bridgeport, Conn; Brockton, Mass; Brunswick, Ga; Butler, Pa; Butte, Mont; Canton, Ohio; Cedar Rapids, Iowa; Chattanooga, Tenn; Chicago, Ill; Chippewa Falls, Wis; Cheyenne, Wyo; Colorado Springs, Colo; Corning, N. Y; Dallas, Tex; Decatur, Ill; Denison, Tex; Denver, Colo; Des Moines, Iowa; Detroit, Mich; Duluth, Minn; East Liverpool, Ohio; East Portland, Ore; Elgin, Ill; El Paso, Tex; Evansville, Ind; Everett, Mass; Findlay, Ohio; Fitchburg, Mass; Fort Scott, Kans; Fort Smith, Ark; Fort Worth, Tex; Fresno, Cal; Gloversville, N. Y; Grand Rapids, Mich; Hastings, Neb; Hazelton, Pa; Helena, Mont; Hot Springs, Ark; Huntington, W. Va; Hutchinson, Kans; Iron Mountain, Mich; Ishpeming, Mich; Jackson, Tenn; Jacksonville, Fla; Johnstown, Pa; Joliet, Ill; Kansas City, Kans; Kearney, Neb; Key West, Fla; Knoxville, Tenn; Kokomo, Ind; La Crosse, Wis; Laredo, Tex; Lima, Ohio; Lincoln, Neb; Little Rock, Ark; Long Island City, N. Y; Los Angeles, Cal; McKeesport, Pa; Macon, Ga; Malden, Mass; Manistee, Mich.

Table showing population growth of various cities from 1880 to 1890, including Marinette, Wis; Marion, Ind; Marion, Ohio; Marquette, Mich; Melrose, Mass; Memphis, Tenn; Menominee, Mich; Meridian, Miss; Milwaukee, Wis; Minneapolis, Minn; Mount Carmel, Pa; Mount Vernon, N. Y; Muncie, Ind; Muskegon, Mich; Nanticoke, Pa; Nashville, Tenn; Nebraska City, Neb; Ogden, Utah; Omaha, Neb; Paris, Texas; Passaic, N. J; Perth Amboy, N. J; Pine Bluff, Ark; Plattsmouth, Neb; Portland, Ore; Pottstown, Pa; Pueblo, Colo; Rockford, Ill; St. Paul, Minn; Salt Lake City, Utah; San Antonio, Tex; San Diego, Cal; Seattle, Wash; Shamokin, Pa; Sheboygan, Wis; Sioux City, Iowa; Sioux Falls, South Dakota; South Bethlehem, Pa; Spokane Falls, Wash; Springfield, Mo; Steelton, Pa; Streator, Ill; Tacoma, Wash; Topeka, Kans; Trenton, N. J; Union, N. J; Waco, Texas; Wausau, Wis; West Bay City, Mich; Wichita, Kans; Winona, Minn; Winston, N. C; Youngstown, Ohio.

EXPERIMENTS FOR THE ARTIFICIAL PRODUCTION OF RAIN.

Among the government appropriations is \$9,000 to be expended in making experiments on the artificial production of rain. We learn that the first experiment will be made in Western Kansas next June under the direction of Col. Dyrenfurth, of Washington.

Balloons filled with hydrogen and oxygen gas will be sent up and exploded by a steel wire attached to the balloons and connected with an electrical apparatus on the ground. Senator Farwell favors this idea because the concussion will be greater, and the greater the concussion, the more copious will be the fall. The balloons will also be aided in their work by the explosion of dynamite on the ground.

Drought is the curse of the Western farmer. In the State of Kansas, the western part especially, the eastern part of Colorado, the Southwest Territories, Texas, the two Dakotas, Nebraska, Minnesota, and, indeed, in nearly all the country west of the Mississippi River the dry seasons are frequent and dangerous to the welfare of the crops. The removal of this great bugbear of the farmer would be a boon that is beyond expression in words.

Those who are interested in the matter will find in the SCIENTIFIC AMERICAN of December 20, 1890, accounts of various examples of rain supposed to have been artificially produced.

PHOTO-ENGRAVINGS FOR NEWSPAPERS.

At the recent annual meeting of the Camera Club, London, Mr. H. Sutton read a paper about a new method of producing photo-blocks for newspaperwork. He said the process was the result of the labor of years. He had been working at the problem since 1881, and only on the previous Monday had he obtained results sufficiently advanced to be worth bringing before the Camera Club. He had effected the direct conversion of photographs into blocks without intermediate conversion into fatty ink or bitumen images, followed by skilled etching to get type-high blocks. A process of this kind ought to give great impetus to the graphic arts. He simply electrotyped a relief image produced in the gelatine bromide film of an ordinary negative; the electrotype is then at once passed on to the printer. A gelatine bromide negative is developed with alkaline pyrogallol or quinol, then fixed in strong hyposulphite of soda, and washed with care, so that it shall not absorb too much water. If it be now placed horizontally on a metal plate, and gradually heated to 212° F., by the flame of a Bunsen's burner, the shadows of the image will be seen to run all over the plate. If, however, before development the negative had also been impressed under a crossed-line screen, so that the line screen and the picture would develop together, each little dot of the screen image would hold a certain amount of reduced silver, bearing some definite pro-