offered in 1893 for research and investigation of atmospheric air in connexion with the welfare of mankind; in 1895 an award of $10,000 was made to Lord Rayleigh and Sir William Ramsay for their discovery of argon; and a medal was awarded to Sir James Dewar in 1899 and one to Sir J. J. Thomson in 1901. During Langley’s administration the American Historical Association was incorporated in 1889 as a branch of the Institution, to whose secretary it makes its annual reports; and the National Society of the Daughters of the American Revolution was similarly incorporated in 1896. By acts of Congress of the 2nd of March 1889 and the 30th of April 1890 the National Zoological Park was established under the Institution; and in a park of 266 acres in the valley of Rock Creek a small collec­tion was installed. In Langley’s Annual Reports the summaries of the advance of science were omitted in 1889 and thereafter special papers of interest to professional students were published in their place. The Smithsonian Park occupies a square equivalent to nine city blocks, almost exactly the same size as the Capitol grounds. The oldest building, that of the Institution proper, was erected in 1847-1855; it is Seneca brown stone in a mingled Gothic and Romanesque style, designed by James Renwick, and occupies the S.W. corner of the grounds. E. of it is the building of the United States National Museum (330 ft. sq.), erected in 1881; and on the N. side of the park is the new building of the National Museum (1903). On the grounds is a bronze statue of Joseph Henry by W. W. Story.

The Institution publishes : *Annual Reports* (1846 seq.), in which the *Reports* of the National Museum were included until 1884—since then they appeared as "part ii.” of that *Report ; The Smithsonian Contributions io Knowledge* (quarto, 1848 sqq.); *The Smithsonian Miscellaneous Collections* (octavos, 1862 sqq.); *Proceedings of the United States National Museum* (1878 sqq.) ; *Bulletin of the United States National Museum* (1875 sqq.), containing larger monographs than those printed in the *Proceedings ;* and occasional *Special Bulletins; Annual Reports of the Bureau of American Ethnology* (1880 sqq.); *Bulletin* (1877 sqq.), including *The Handbook of American Indians North of Mexico* (1907), part i. being Bulletin 30; and *Contributions. to North American Ethnology* (1877 sqq.); *Annals of the Astrophysical Observatory* (1900 sqq.) ; and *Annual Reports of the American Historical Association* (1890 sqq.).

Authorities.—See Wm. J. Rhees, *A List of Publications of the Smithsonian Institution, 1846-1903* (Washington, 1903), being No. 1376 of the Smithsonian Miscellaneous Collections; also *The Smithsonian Institution, 1846-1896: The History of its First Half- Century* (Washington, 1897), edited by George Brown Goode, assistant secretary of the Institution; Wm. J. Rhees, *Smithson and His Bequest (ibid.* 1880), and *The Smithsonian Institution, 1846- 1899 (ibid.* 1901) ; and Richard Rathbun, *The National Gallery of Art (ibid.* 1909), being Bulletin 70 of the U.S. National Museum.

**SMOHALLA,** or Shmoquala *(i.e.* “preacher”), chief of the Wanapum tribe of North American Indians and founder of the religious sect called Dreamers, was born about 1820. On one occasion after a tribal fray he was left for dead, but recovered and journeyed through California, Mexico, Arizona and Nevada to his old home on the upper Columbia, Washington, where he announced that he had been in the spirit world and had returned with a new revelation. This consisted in a return to primitive Indian customs, and a priesthood and ritual based on the Roman Catholic type. Besides Sunday services the Dreamers hold a service for the commemoration of the dead in early spring, and thanksgivings for salmon and for berries in April and in October respectively. Smohalla had frequent trances and his influence extended over most of the tribes of eastern Washington, and Oregon and western Idaho. The sect gave some trouble in 1870 by refusing to come under reservation restrictions. A church was established at Priest’s Rapids on the upper Columbia, and one at Union Gap on the Yakima reservation.

See James Mooney, "The Ghost-dance religion,” in *14th Ann. Rep. Bureau of Ethnology* (Washington, 1896).

**SMOKE** (from O. Eng. *smēocan,* to smoke, reek, cf. Dutch *smook,* Ger. *Schmauch,* probably allied to Gr. *σμbχew)i* the vapour or volatile matter which escapes from a burning substance during combustion, especially the visible vapour produced by the burning of coal, wood, peat or vegetable substances generally. In this article the various legislative and other measures recom­mended or adopted for the abating of the nuisance caused by the excessive production of smoke are dealt with. For smoking of tobacco see Tobacco and Pipe, and for opium-smoking Opium.

*Smoke Abatement.—*The nuisance created by coal smoke seems to have been recognized in London since 1306, when a citizen was tried, condemned and executed for burning “ sea cole ” in the city of London; but it is only in more modern times that the question has been regarded as one of real practical importance. In 1785 the first smoke-abating invention was patented by James Watt, and in 1800 a mechanical stoker was patented by Robertson. In 1815 Cutler patented the first would-be smokeless grate for domestic purposes; and his principle of feeding underneath was afterwards adopted by Dr Neil Arnott. In 1819 a parliamentary select committee was appointed “ to inquire how far persons using steam-engines and furnaces could erect them in a manner less prejudicial to public health and comfort.” In 1843 another select committee recommended the introduction of a bill prohibiting the produc­tion of smoke from furnaces and steam-engines. In 1845 yet another select committee reported that such an act could not in the existing state of affairs be made to apply to dwelling­houses. The Acts of 1845 and 1847 followed as the results of these inquiries; and since then there has been much legislation brought to bear on factories and railways.

The Public Health Act 1875 contains the statutory law as to the emission of smoke and applies throughout the country, except to London and a few large provincial towns such as Manchester, Liverpool, Sheffield, Leeds, Bradford and Nottingham, where smoke nuisances are controlled by special local acts. The law applying to the Metropolis is identical with that which governs the country at large, and is contained in the Public Health (London) Act 1891.

Section 91, sub-section 7, of the Public Health Act 1875 enacts: “Any fireplace or furnace which does not, as far as practicable, consume the smoke arising from the combustible used therein, and which is used for working engines by steam, or in any mill, factory, dyehouse, brewery, bakehouse or gaswork, or in any manufacturing or trade process whatsoever ” ; and sub-sec. 8, “any chimney (not being the chimney of a private dwelling-house) sending forth black smoke in such quantity as to be a nuisance, shall be deemed to be a nuisance liable to be dealt with summarily in manner provided by this act.”

A further clause provides that for the purposes of sub-sec. 7 the offence is not merely the emission of smoke, but the use of a fire­place or furnace “ which does not as far as practicable consume the smoke,” and this enables a technical defence to be raised which in practice has been found to destroy the efficacy of sub-sec. 7. Under sub-sec. 8 the mere fact of sending forth black smoke in such quantity as to be a nuisance is an offence, unless it be emitted from the chimney of a private dwelling-house. This sub-section is therefore always resorted to by sanitary authorities who initiate prosecutions for smoke nuisances. It has been decided that where black smoke issued from a chimney several times a day for varying periods the magistrate was justified in finding that the smoke issued in “ such quantity as to be a nuisance,” although it was not shown that any particular person, or property, was injuriously affected thereby *(South London Electric Supply Corporation v. Perrin* (1901) 2 K.B. 186). It has also been held that smoke need not be injurious to health in order to be a nuisance *(Gaskell* v. *Bayley,* 30 L.T.N.S. 316). It therefore follows that the issue of black smoke from ordinary factory chimneys is *per se* a nuisance. From a practical point of view, however, it is often found difficult to identify exactly the colour of the smoke, the appearance of which varies in accordance with the position of the observer, and the light behind or in front of the smoke. To aid inspectors various smoke charts and instruments have been devised, none of which is wholly satisfactory. The best chart is the Ringlemann smoke scale, made by ruling black lines at right angles on a white background. It has six shades, numbered 0-5, obtained by graduating the thickness of the lines.

The difficulty of accurately defining the colour of smoke has led to a movement, initiated by the London County Council, for securing the deletion of the word “ black ” from the Public Health Act, so as to leave to magistrates the duty of deciding a question of fact—whether the smoke complained of constituted a nuisance. The Nottingham Improvement Act 1874 (sec. 74) contains the most efficacious provisions in regard to smoke nuisances which are to be met with in England. It enables steps to be taken in cases where the engines or furnaces are not suitable, and if they are properly constructed, but negligently used, it enables the fireman or other responsible employee to be fined.

Although steam-engines and factories consume individually much more coal than dwelling-houses, they alone are not respon­sible for the smoke nuisance, for there is little doubt that domestic fires are mainly responsible for the smoky condition of the atmosphere of our towns, for they continue to evolve smoke undeterred by legislation. In 1881, however, a movement was begun by the National Health Society and the Kyrle Society, which resulted in a smoke abatement exhibition being held at