

have suffered the consequence of a lack of any general system of public policy covering the location, construction, and maintenance of roads. American roads are far below the average: they certainly are among the worst in the civilized world, and always have been, — largely as a result of permitting local circumstances to determine the location, with little or no regard for any general system, and haste and waste and ignorance in building.

Among the benefits attendant upon the proper construction and maintenance of roadways, the speaker mentioned the following. Good roads attract population, as well as good schools and churches, and they improve the value of property; so that it is said a farm lying five miles from market, connected by a bad road, is of less value than an equally good farm lying ten miles away from market, connected by a good road. A larger load can be drawn by one horse over a good road than by two over a bad one. Good roads, consequently, encourage the greater exchange of products and commodities between one section and another, besides being of great value to railroads as feeders.

As one solution of the road problem, Col. Pope outlined the following plan. A commissioner of highways might be provided for, in the Agricultural Department, with a corps of consulting engineers, and suitable appropriations made for the prosecution of a general supervising work. Under the charge of this commission, full systems of maps should be prepared; based largely, perhaps, upon the working of the state and county boards, showing more or less completely, as circumstances would permit, the highways of the country.

For co-operation with this central bureau, and the prosecution of the work in the most thorough and practical way, each State should have its highway commissioner, charged with the highest interests of the State in the way of maintaining its system of roads under the most approved methods and for the general public welfare. Then the best practical results could probably be attained by the division of the State into highway districts, consisting of counties, or perhaps townships, each of which should have its overseer, in full charge of the opening and construction of new roads in his district and the proper maintenance of all, responsible for the expenditure of the regular appropriations for these purposes. These districts could then be divided into smaller ones under sub-overseers.

The importance and the value to any country, any section, and every citizen from the highest to the lowest, whether tax-payers or tramps, of well-constructed and properly maintained roads, are not easily estimated, but clearly are greater than of many affairs which are continually receiving the time and attention of the people in their homes, counting-rooms, public meetings, and legislative halls. It is a matter to be considered side by side with our splendid and always improving system of public education, the assessment of our tariff duties, or the appropriations regularly made for river and harbor improvements.

#### R. A. PROCTOR MEMORIAL FUND.

THE English magazine *Knowledge* calls attention to the announcement in many of the London papers stating that the monetary affairs of the late Mr. Proctor have now been wound up by his administrator, and that the total sum available as provision for his widow and the seven children (four of whom are daughters, and one a little boy, a permanent invalid from hip-disease) is under £2,000. To the small income which this will produce there is to be added £100 per annum from the Civil List; which is, however, granted only during Mrs. Proctor's life.

The £2,000 above referred to as the value of the residue after the settlement of all debts, some of which were waived, has been produced by the sale of Mr. Proctor's copyrights. Mrs. Proctor and the eldest daughter have, under a satisfactory arrangement with Messrs. Longmans, retained a small interest in the works now in Messrs. Longmans' hands, including the "Old and New Astronomy," which will shortly be completed. But the value of the interest retained (calculated on the basis of the sum given for the remainder of these copyrights by Messrs. Longmans) is included in the £2,000, as is also the money received for all the other copyrights, which were purchased on liberal terms either by Messrs. Chatto & Windus or by Messrs. W. H. Allen & Co.

The money given immediately after the death of the late Mr. Proctor by the Royal Literary Fund, and the proceeds of five lectures given by Mr. W. Lant Carpenter, as well as gifts from other friends, have enabled the family, who, owing to the suddenness of Mr. Proctor's death, were absolutely without resources, to weather through the first year. But these funds have now been exhausted, and a committee is in course of formation which the many friends of Mr. Proctor are invited to join. Subscriptions to the R. A. Proctor Memorial Fund, and communications, will be received by Mr. E. G. Mullins, manager of the City Bank, Bond Street Branch, London, England.

Since the date of the announcement in the daily papers, the following subscriptions have been received: William James Adams, Esq., 10s. 6d.; "E. A.," £2; Mrs. Barrett, £2; "J. A. B.," £1; Andrew Chatto, Esq., £5; H. P. Curtiss, Esq., £5; W. Henry Domville, Esq., £10; "W. D.," £2 2s.; "A Friend," £1; Professor Grant, £2 2s.; Lord Grimthorpe, £20; D. Hodgson, Esq., £1; Edmund Johnson, Esq., £1 1s.; Messrs. Longmans, Green, & Co., £20; J. Mott Maidlow, Esq., £3 3s.; Miss Martin, £2; G. H. Mellor, Esq., 10s.; R. Hay Murray, Esq., £5; "Planetoids," 10s. 6d.; T. Shaw Petty, Esq., £10 10s.; Oscar Rohde, Esq., £3 3s.; T. C. Sandars, Esq., £5; William Schooling, Esq., £2 2s.; F. Stevens, Esq., £1 1s.; Col. N. G. Sturt, £5; Mrs. Stowe, 5s.; Walter Weblyn, Esq., £1 1s.; Philip Williams, Esq., £1; total, £113 1s. Others have promised.

#### A NEW METHOD OF PREPARING FLUORINE.

A NEW method of preparing fluorine has been discovered by M. Moissan. This discovery is the outcome of the success which has attended M. Moissan's efforts to prepare anhydrous fluoride of platinum. During the process of his memorable work upon the isolation of fluorine by the electrolysis of hydrofluoric acid containing hydrogen potassium fluoride, one of the most remarkable phenomena noticed was the rapidity with which the platinum rod forming the positive electrode was corroded by the action of the liberated gaseous fluorine. It was surmised that a fluoride of platinum was the product of this action, but hitherto all efforts to isolate such a body have proved unsuccessful. In fact, for a reason which will be discussed subsequently, it is impossible to prepare platinum fluoride in the wet way. M. Moissan has, however, as stated in *Nature*, been enabled to prepare anhydrous platinum fluoride by the action of pure dry fluorine itself upon the metal. It was found at the outset, that, when fluorine is free from admixed vapor of hydrofluoric acid, it exerts no action whatever upon platinum, even when the latter is in a finely divided state, and heated to 100° C. But when the temperature of the metal is raised to between 500° and 600° C., combination readily occurs, with formation of tetrafluoride of platinum and a small quantity of protofluoride. The moment the gas is mixed with a little vapor of hydrofluoric acid, the action is immensely accelerated, and then occurs readily at ordinary temperatures. The same rapid action occurs when platinum is placed in hydrofluoric acid saturated with free fluorine, which accounts for the disappearance of the positive terminal during the electrolysis.

In order to prepare the fluoride of platinum, a bundle of wires of the metal is introduced into a thick platinum or fluor-spar tube, through which a current of fluorine gas from the electrolysis apparatus is passed. On heating the tube to low redness, the wires become rapidly converted to fluoride, when they are quickly transferred to a dry stoppered bottle. If the operation is performed in a platinum tube, a large quantity of fused fluoride remains in the tube. The tetrafluoride of platinum (PtF<sub>4</sub>) formed upon the wires consists either of fused masses of a deep red color, or of small buff-colored crystals resembling anhydrous platinum chloride. It is exceedingly hygroscopic. With water it behaves in a most curious manner. With a small quantity of water it produces a fawn-colored solution, which almost immediately becomes warm, and decomposes with precipitation of hydrated platonic oxide and free hydrofluoric acid. If the quantity of water is greater and the temperature low, the fawn-colored solution may be preserved for a few minutes, at the expiration of which, or immediately on boiling the solution, the fluoride decomposes in the manner above indi-