and then standing almost motionless, with bright red bill and legs, large eyes, a full pendent crest, and is generally of a light slate-colour, paler beneath, and obscurely barred on its longer wing-coverts and tail with a darker shade. It is only when it spreads its wings that these are seen to be marked and spotted with white, rust-colour, and black, somewhat after the pattern of those of the sun-bittern. Like that bird, too, the kagu will, in moments of excitement, give up its ordinary placid behaviour and execute a variety of violent gesticu­lations, some of them even of a more extraordinary kind, for it will dance round, holding the tip of its tail or one of its wings in a way that no other bird is known to do. Its habits in its own country were described at some length in 1863 by Μ. Jouan *(Mém. Soc. Sc. Nat. Cherbourg,* ix. 97 and 235), and in 1870 by Μ. Marie *(Actes Soc. Linn. Bordeaux,* xxvii. 323-326), the last of whom predicts the speedy extinction of this interesting form, a fate foreboded also by the statement of Messrs Layard *(Ibis,* 1882, pp. 534, 535) that it has nearly disappeared from the neighbourhood of the more settled and inhabited parts.

The internal and external structure of both these remarkable forms is now fully known and it appears that they, though separable as distinct families, Eurypygidae and Rhinochetidae, must be deemed the relics of very ancient and generalized types more or less related to the Rallidae (see Rail), and Psophiidae (see Trumpeter). It is only to be remarked that the eggs of both *Eurypyga* and *Rhinochetus* have a very strong ralline appearance—stronger even than the figures published *(Proc. Zool. Soc.,* 1868, pl. 12) would indicate.

(A. N.)

**SUNBURY,** a borough and the county seat of Northumber­land county, Pennsylvania, U.S.A., on the Susquehanna river about 53 m. by rail N. by É. of Harrisburg. Pop. (1900), 9810, of whom 197 were foreign-born; (1910 U.S. census) 13,770. It is served by the Pennsylvania, the Northern Central (controlled by the Pennsylvania) and the Philadelphia & Reading railways. Sunbury’s principal industry is the manufacture of silk; the Pennsylvania railway has repair shops here. The total value of the borough’s factory products increased from $1,868,157 in r900 to $2,592,829 in r905, or 38·8%. The borough stands on the site of the old Indian village, Shamokin, which was occupied by Delawares, Senecas and Tutelos, and was long the most prominent Indian village in the province; in 1747-1755 there was a Moravian mission here. Owing to the strategic importance of the place the provincial government erected Fort Augusta here in 1756; during the War of Independence many of the fugitives from the Wyoming Massacre tame to this fort. Sunbury was first surveyed in 1772 and was incorporated as a borough in 1797.

**SUNBURY-ON-THAMES,** an urban district in the Uxbridge parliamentary division of Middlesex, England, 17 m. S.W. of St Paul's Cathedral, London, on a branch of the London & South Western railway. Pop. (1901), 4544. It is a favourite riverside resort and has grown considerably as a residential district. The church of St Mary, Byzantine in style, dates from 1752. There are pumping works and filtration beds for the water-supply of London. To the north-east is Kempton Park, the manor-house of which was a royal residence early in the 14th century. The park is famous for its race-meetings, thc principal fixture being the Jubilee Handicap, established in 1887. The manor was granted by Edward the Confessor to Westminster Abbey, and passed in the 13th century to the see of London and in the 16th to the Crown; but was not so held later than 1603.

**SUN COPYING,** or Photo Copying, the name given to that branch of photographic contact printing which is carried out without the aid of a camera-made negative. It is now used very extensively for copying documents, especially the plans of architects and engineers.

The earliest discovered process, the ferroprussiate, is still the one most largely used, on account of its economy and per­manence, combined with a simplicity of manipulation that renders it highly suitable for office use; it was invented in 1840 by Sir John Herschel. This method has the disadvantage that the copies arc blue in colour, and, as it is a negative process, the black lines of the original become the white lines of the print; the development is by washing in water, so that the important feature of accuracy of scale is lost. The next step of importance was in 1864, when William Willis of Birmingham, the father of the inventor of the platinotype system of photographic printing, invented the aniline process. In this method a paper sensitized with bichromate of potassium is exposed to light, with the document (generally a tracing) in front of it; the un­protected lines are bleached out, but the protected ones remain and are developed by contact with vapour of aniline, a sub­sequent washing for the removal of chemicals completing the print. For twenty years this process was successfully used with little opposition other than that of the blue prints pre­viously referred to, and of the Pellet process, which gave a blue line on a white ground, the inventor being associated throughout with the firm of Vincent Brooks, Day & Son; but since that time a large number of other methods have come into use, some requiring a paper negative in the first instance and some not, but all much aided by improved methods of applying electric light. the earliest of these improved systems utilizing electric light was that invented by Mr B. J. Hall, whose photo-copier consists of two semi-circular glasses forming a cylinder, which may be revolved, and through which an arc lamp travels, while the tracing and sensitized paper are strapped to its outer surface.

Between 1900 and 1908 attention was chiefly directed to overcoming the variation of scale that is inevitable in all systems that require a final washing in water either for development or for the removal of chemicals; and at least four excellent systems have arisen. While Mr F. R. Vandyke was perfecting the system which he patented in 1901 and which has been adopted by the Ordnance Survey Department at Southampton, Messrs Vincent Brooks, Day & Son were working along somewhat similar lines, the outcome of which was their “ True-to-Scale Photo Litho ” system. In both these methods a reversed positive print is secured on zinc, from which copies can be made in printer’s ink of any colour by the usual lithographic method on almost any material that may be desired. The plates prepared by these methods are so sensitive to light that excellent results can be secured from drawings made even on semi-transparent material such as drawing paper, and of course the plates when made are capable of alteration or addition and can be stored for reprints.

An admirable process had since been invented by MM. Dorel Frères of Paris, which is even more expeditious, and being less in prime cost is more suitable when only a small number of prints is required. In this case a large sheet of thin zinc is coated with chemically-treated gelatin, with the result that when a ferroprussiate print is pressed down on it either with the hand or by a roller the protected lines affect the gelatin in such a way that the parts that have been in contact with them receive a greasy ink while the remainder of the surface rejects it, so that a small number (not generally exceeding six) of very excellent prints can be secured. The inventors refrained from taking out a patent either in France or elsewhere, preferring to