notably of lupus. He later invented the lamp which bears his name. The original Finsen lamp comprised a voltaic arc of 60 to 80 amperes round which four tubes collected the light by quartz lenses, the light being cooled by passing through water and the tubes being surrounded by a water-jacket. the usual exposure was one hour. In the Finsen-Reyn modification now used, a single collect­ing tube fitted on an adjustable stand is placed in front of a scissors arc lamp consuming 20 amperes. The rays are cooled and water-jacketed as in the original. A suitable, quartz compressor with a chamber containing circulating water is. pressed upon the skin of the part to be treated and held at right angles to the impinging rays. The time of exposure is now reduced to forty-five minutes.

Radium when used in surgery is applied by means of applicators, either having the fixed salts on square or oblong metallic plates or cloths or by applicators having free radium in sealed metal, tubes. These tubes are sometimes buried in the tissues. Sometimes a method of “ screening ” is adopted in order to modify the intensity of the radiation. This is done by enveloping the tubes containing the radium in cases of silver, lead or nickel of various thicknesses. In this, known as the method of Dr Dominici, the α and *ß* rays are intercepted by the metal screens and the highly penetrative rays only applied to the morbid tissues.

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**SURICATE,** or Meerkat *(Suricata tetradactyla')*, a small South African mammal of the civet family, ranging from Cape Colony to Algoa Bay. The head and body are about 14 in. long, and the tail half as much; the fur is long and soft, light grizzled grey in colour, and banded with black on the lower part of the back. Meerkats are sociable animals, living in holes in the rocks on the mountains, and burrowing in the sandy soil of the plains. They form amusing pets, and in a wild state, writes Mrs A. Martin, they feed chiefly on “ succulent bulbs, which they scratch up with the long, curved, black claws on their fore-feet. They are devoted sun-worshippers and in the early morning, before it is daylight, they emerge from their burrows and wait in rows till their divinity appears, when they bask joyfully in his beams.”

**SURINAM TOAD** *(Pipa americana),* an aglossal tailless Batrachian, rendered famous by its mode of reproduction, first observed in 1710 by the Dutch anatomist F. Ruisch. It inhabits South America east of the Andes and north of the Amazons, and is thoroughly aquatic. In its extremely flattened head it is paralleled by two other vertebrates only, which, curiously, inhabit the same parts of South America, viz. the Silurid fish *Aspredo batrachus* and the Chelonian *Chelys matamata;* the end of the snout and the angles of the jaws bear several lappets, the fingers terminate in a star-shaped appendage, the toes are very broadly webbed and the eyes are minute and without lids.

The eggs are carried on the back by the mother, and the skin thickens and grows round the eggs until each is enclosed in a dermal cell, which is finally covered by a horny lid, believed to be formed by a secretion of the skin or else to represent the remains of the gelatinous capsule which at first surrounded the eggs. These, which may number about one hundred and measure five to seven millimetres in diameter, develop entirely within these pouches, and the young hop out in the perfect condition, without a vestige of a tail. Pairing takes place in the water, the male clasping the female round the waist. The way in which the eggs reach the back of the female has been observed in specimens kept in the London Zoological Gardens. During oviposition the cloaca projects from the vent as a bladder-like pouch, which is inverted forwards, between the back of the female and the breast of the male, and by means of this ovi­positor the eggs arc evenly distributed over the whole back How the eggs are fertilized has not been ascertained.

Authorities.—G. Grönberg and A. von Klinckowström, “ Zur Anatomie der Pipa americana,” *Zool. Jahrb. Anat.* vii. 609; A. D. Bartlett, “ Note on the Breeding of the Surinam Water Toad," *Proc. Zool. Soc.* (1896), p. 595.

**SURMA,** or Barak, a river of Assam, India. It is one of the two chief rivers of the province, watering the southern valley as thc Brahmaputra waters the northern and larger valley. It rises in the Barail range to the north of Manipur, its sources being among the southern spurs of Japvo. Thence its course is south with a slight westerly bearing, through the Manipur hills to British territory. The name of Barak is given to the upper part of the river, in Manipur and Cachar. A short distance below Badarpur in Cachar it divides into two branches. One of these, which passes Sylhet, is called Surma. The other is called Kusiara till it subdivides into (*a*) a branch called Bibiana or Kalni, which joins the Surma near Ajmiriganj, and (*b*) a branch which resumes the name of Barak and joins the Surma near Habiganj. At Bhairab Bazar in Mymensingh the Surma unites with the old Brahmaputra and becomes known as the Meghna. The river is navigable by steamers as far as Silchar in the rains. Total length about 560 m.

The Surma Valley and Hill Districts Division is a division of the province of Eastern Bengal and Assam. It includes the five districts of Sylhet Cachar, Lushai hills, Naga hills, and Khasi and Jaintia hills, with a total area of 25,481 sq. m. and a population in 1901 of 3,084,527.

**SURPLICE** (Late Lat. *superpelliceum;* Fr. *super,* over, and *pellis,* fur; Span, *sobrepellice∙,* Fr. *surplis·,* in Ital. *cotta* and Ger. *Chorrock,* choir coat), a liturgical vestment of the Christian Church. It is a tunic of white linen or cotton material, with wide or moderately wide sleeves, reaching—according to the Roman use—barely to the hips and elsewhere in the churches of the Roman communion to the knee It is usually decorated with lace, but in modern times—in Germany at least —also with embroidered bordures. The surplice originally reached to the feet, but as early as the 13th century it began to be shortened, though as late as the 15th century it still fell to the middle of the shin, and it was not till the 17th and 18th centuries that it was considerably shortened. More drastic were other modifications which it underwent in course of time in several localities, which led to the appearance of various sub­sidiary forms alongside of the original type. Such were the sleeveless surplice, which was provided at the sides with holes to put the arms through; the surplice with slit-up arms or lappels (so-called “ wings ”) instead of sleeves; the surplice of which not only the sleeves but the body of the garment itself were slit up the sides, precisely like the modern dalmatic; and, finally, a sort of surplice in the form of a bell-shaped mantle, with a hole for the head, which necessitated the arms being stuck out under the hem. The first two of these forms were very early developed; and, in spite of their prohibition by synods here and there *(e.g.* that of Liège in 1287), they survive In various places to the present day. The latter two only appeared after the close of the middle ages: the first of them in South Germany, the second more especially in Venetia, where its use is attested by numerous pictorial records. As a rule, however, these subsidiary forms of surplice were worn mostly by the lower clergy. They were the result partly of the influence of the secular fashions, but more particularly of considerations of convenience.

Thc surplice belongs to the *vestes sacrae,* though it requires no benediction. It is proper to all clerics, even to those who have only received the tonsure, the bishop himself vesting with it those who have been newly tonsured by him. Its use in divine service is very varied. It is worn in choir at the solemn offices; it is the official sacral dress of the lower clergy in their liturgical functions; it is worn by the priest when administering the sacra­ments, undertaking benedictions, and the like; the use of the alb being nowadays almost exclusively confined to the mass and functions connected with this. In general it may be said