her a bill for the washer-woman, who was waiting for the linen. Neither paper nor ink being at hand, the bill was written on the stone he had just polished. The ink used was composed of wax, soap and lamp-black. Some time afterwards, when about to wipe the writing from the stone, the idea all at once struck him to try the effect of biting the stone with aqua fortis. Surrounding the stone with a border of wax, he covered its surface with a mixture of one part of aqua fortis and ten parts of water. The result of the experiment was that at the end of five minutes he found the writing elevated about the tenth part of a line (1/120 in.). He then proceeded to apply the printing ink to the stone, using at first a common printer’s ball, but soon found that a thin piece of board covered with fine cloth answered better, communicating the ink more equally. He was able to take satisfactory im- pressions, and, the method of printing being new, he hoped to obtain a patent for it, or even some assistance from the govern- ment. For years Senefelder continued his experiments, until the art not only became simplified, but reached a high degree of excellence in his hands. In later years the king of Bavaria settled a handsome pension on Senefelder. He died at Munich in 1834, having lived to see his invention brought to comparative perfection.

SENEGA, the dried root of the Polygala Senega, which is official in the British and United States pharmacopoeias. Senega contains an active principle, saponin. Senega is used chiefly as a stimulating expectorant in chronic bronchitis. It is occasionally used as a diuretic in renal dropsy. It is a cardiac depressant, and is contra-indicated in diseased conditions of the heart. It has a tendency to upset the digestion, and is therefore only used in combination with other drugs in what are termed ex­pectorant mixtures.

SENEGAL, a river of West Africa, entering the Atlantic about 16° N., some 10 m. below St Louis, after a course of fully 1000 m. It is formed by the junction of the Bating or Black river and the Bakhoy or White river, and its chief affluent is the Faleme. North of the Senegal the Sahara reaches the coast, and for over 1000 miles no river enters the ocean.

The Bating rises in the Futa Jallon highIands about 2400 ft. above sea-level, in 10° 28' N., 10° 5' W., its source being within 125 m. of Konakry on the Gulf of Guinea. It is joined in about 11° 10' N. and 11° 45' W. by the Tene, which rises in 13° W. and 10° 37' N. and flows north-east. A little south of 12° N. the Bating is a large stream 250 yds. wide, and is here separated from the sources of the Faleme by a line of hills 2600 ft. high, which send to the latter river four important streams rising in about 12°N. The Bating follows a northward course for about 350 m., during which it descends by a scries of rapids till it reaches a level of 360 ft. above the sea. The headstreams of the Bakhoy rise between 11° 30' and 12° N. and 9° 20' and 9° 50' W. on theN.E. versant of the hills which here form a narrow divide between the basin of the Senegal and that of the upper Niger. The Bakhoy, in its upper course much interrupted by rapids, flows N.E., but about 12° 15' N. turns north-westward. Its principal affluent, the Baule (Red river), and its headstreams rise farther east on the northern slopes of the hills which above Bamako shut in the Niger. The eastern headwaters of the Senegal thus drain a large area adjacent to the upper Niger. The Baule flows north and in a series of loops reaches 14° 20' N., where it turns westward and in about 13° 30' N. and 10° W. joins the Bakhoy. After receiving the Baule, the Bakhoy, now a river of fine proportions, flows W. by N. through rocky country in a narrow valley. In 11° 55' W. and 13° 48' N. it unites with the Bafing. At the confluence the Bakhoy is 800 ft. wide, the Bating at this point having a width of 360 ft.

After the junction of the Black and White rivers the united stream is known as the Senegal. The confluence is called Bafulabé, *i.e.* "meeting of the waters.” Below Bafulabé the river flows N.W. through a valley bordered on either side by hills which throw out rocky spurs, over which the Senegal descends in a succession of falls, those of Guina (160 ft.) and of Felu (50 or 60 ft.) being the most important. It receives from the north several intermittent streams, the chief, usually carrying a fair amount of water, being the Khulu or Kolimbine, coming from the Kaarta plateau. From the south it is joined by the Faleme, a considerable river which rises in hilly

country in about 11° 50' N. and 11° 30' W. The first rise in the lower Senegal is due to the rains in the source region of the Faleme, the flood water passing down that stream more quickly than down the Bafing owing to its shorter course. A short distance below the Felu Falls is the town of Kayes on the left bank of the river. Be- tween the falls and Bakel (85 m.) there are twenty-seven “ narrows,” of which several, such as that at Kayes, are difficult. Kayes is the limit of navigability from the sea. From that town a railway connects with the navigable waters of the upper Niger at Bamako (see Senegal: *Country, I.).*

Below Bakel the river passes through flatter country and presents a series of great reaches. It sends off numbers of divergent channels (called *marigots)* forming several islands, the largest being that of Morfil, 110 m. long. The river attains its most northerly point, 16° 30' N., in about 15° 10' W. Thereafter it runs S.W. and finally due S. In the last 10 m. of its course it runs parallel to the sea, from which it is separated by a narrow line of dunes. On an island at the head of this 10 m. is St Louis, the capital of the colony of Senegal. At this point the right branch of the river is only 500 ft. from the open Atlantic. A marigot, called the Ndiadier or Maringuins, leaves the river 40 m. above St Louis, pierces the dunes at flood time and reaches the sea, 50 m. N. of the mouth oí the river. The Senegal indeed has what is styled an interior delta, but, with the exception of the marigot named, all the divergent branches rejoin the main stream before the sea is reached.

The comparative scantiness of its sources, the steepness oí its upper course and the rapid evaporation which takes place after the short rainy season would make the Senegal an insignificant stream for more than half the year; but natural dams cross the channel at intervals and the water accumulates behind them in deep reaches, which thus act as reservoirs. In the rainy season the barriers are submerged in succession, the reaches are filled and the plains of the lower Senegal are changed into immense marshes. Lake Cayor on the right side of the lower Senegal and Lake Panieful (Guier) on the left constitute reserve basins, receiving the surplus waters of the river during flood and restoring them in the dry season. In the upper part of the river the reservoirs are partially protected by curtains of verdure from the effects of the evaporation which makes itself so severely felt on the treeless seaboard. Owing to these natural “ locks,” the Senegal never discharges less than 1700 or 1800 cubic ft. per second. The lower Senegal forms the boundary between the Sahara and the western Sudan; the line of its inundations is an ethnographic march between the nomadic Berber and the settled Negro.

From July to October the level of the Senegal shows a series of fluctuations, with, however, a general increase till the end of August or beginning of September, when the maximum occurs. Boats drawing from 1 ft. to *2* ft. 6 in. can ascend to Kayes from the beginning of June to the middle of November; steamers drawing 4 ft. 3 in., from July to October inclusive; and ocean steamers, lightened so as to draw 11-13 ft., during August and September. From Mafu to the sea, a distance of 215 m., the Senegal is navigable all the year round by vessels drawing not more than 10 ft.

The existence of the Senegal appears to have been known to the ancients. It is usually regarded as the Chretes or Chremetes of Hanno, and the Nachyris and Bambotus of the Greeks and Romans, but it is not possible definitely to identify it with any of the rivers on Ptolemy’s map. Idrisi and other medieval Arabian geographers undoubtedly refer to it. The seamen of Dieppe are said to have discovered the river about 1360, and even to have built a fort which became the nucleus of the town of St Louis, but this claim is unproved (sec Guinea). The mouth of the Senegal, then called Senaga, was entered in 1445 by the Portuguese navigator Dinas Diaz (who thought it a western arm of the Nile), and in 1455 Cadamosto ascended the river for some distance. Leo Africanus rightly describes its lower course as “ severing by its winding channel the barren and naked soil from the green and fruitful.” It was not until 1637 that the explora­tions of the upper river began, Jannequin, Sieur de Rochfort, in that year ascending the river some 200 m. above St Louis. In 1697 André Brüe reached the island of Morfil, while in 1698 he penetrated past the Felu Falls. At that period geographers regarded the Senegal as the termination of the Niger, a theory held until Mungo Park’s demonstration of the eastward course of that stream. Park himself added much to the knowledge of the upper basin of the Senegal. It was not until 1818 that the source (*i.e.* of the Bafing) was located, by Gaspard Mollien.

See G. Mollien, *Découverte des sources du Sénégal et de la Gambie* (Paris, ed. 1889), with introduction by L. Ravaisson-Mollien ; J. Ancelle, *Les Explorations au Sénégal et dans les contrées voisines* (Paris, 1886); M. Olivier, *Le Sénégal* (Paris, 1908); Captain Fromaget, "L’Hydrographie du fleuve Sénégal,” in *B.S.G. Comm. Bordeaux,* xxxii. (1909).