

zinc, and as this alloy can be rolled out hot it is much more cheaply and expeditiously prepared than ordinary sheet brass.

Wire Drawing.—Brass wire is consumed in enormous quantities, first and chiefly for pin-making, next for shoe-rivets, then for brush-making, for paper-makers' wire web, and many other purposes. The metal for wire drawing is rolled into long strips of a suitable thickness and cut into "strands" by means of slitting rolls. The strands, which are square in section, are drawn through a succession of circular holes in a steel draw-plate, till the desired degree of fineness is reached, and are wound upon a rotating drum or block. The wire has to be repeatedly annealed as it passes through the plates of ever-diminishing gauge.

Stamping.—A large number of useful articles, as well as many ornamental details, which were formerly produced by the process of casting, are now cheaply and expeditiously made by stamping out of sheets of rolled brass. In this way the ornamentation applied to the cheaper kinds of gasaliers, balance-weights, chain-links, &c., are formed, and cornice-pole ornaments and curtain-rings made; and the process is also applied to the making of door and shutter knobs, finger plates, and lamp-burners, and to the striking up of many useful articles, such as basins and other vessels. In the process of stamping, a die, in which the pattern to be formed is sunk, is prepared by the ordinary process of die sinking, and securely fixed to a heavy iron block sunk into the ground. From each side of this block rise two cast-iron guide pillars, which act as guides to the heavy hammer or ram arranged to slide up and down between them. Into this hammer a "force," or exact counterpart of the sunk die, is fitted, so that on the fall of the hammer the force exactly fits into the die. The work of the stamper in raising his hammer is much lightened by passing the lifting belt over a pulley attached to a shaft moved by steam-power. By this arrangement the workman has only to hold his cord sufficiently tight to create the friction between the belt and pulley necessary to raise the weight, and by letting go his hold, the stamp is allowed to fall with its full momentum against the die. In a compound of such hardness and brittleness as brass it is necessary to raise any pattern by repeated strokes, annealing the metal between each separate blow. The number of blows necessary to bring up any pattern depends on the depth and convexity of the die. The "forces," or counterparts of the die, are made of lead, tin, or other soft metal, while for finishing the stamping when the die contains fine details a "force" made of brass is employed. A modification of the steam-hammer has been adapted for use in the process of stamping. Stamped work as compared with castings is deficient in depth and richness, as it is not practicable to attain any great boldness and sharpness of outline, and the "force" having to fit into every portion of the die, no undercutting is possible. Globular articles, such as balance weights, are stamped in two (or if necessary more) parts and the pieces joined by soldering. Mr James Atkins of Birmingham has patented an ingenious method of filling stamped shells, such as balance-weights, with molten iron by simply keeping the shell in water while it is being filled.

Tube-making.—Brass tubes are of three principal kinds:—1st, ordinary soldered; 2d, cased; and 3d, solid tubing. Plain soldered tubes are made from sheet-brass by cutting off, with circular shears, strips of the breadth necessary for the gauge of the tube to be made. These strips are passed through "cupping-rolls," by which they are partially bent round. The end of the strip is then formed into a tang, caught and drawn through a tool called a conductor, which folds over the strip into a circular form, bringing the two edges into close contact. The tube so formed is tightly

tied up with wire at short intervals to keep the edges together in the process of soldering; a mixture of granulated brass and borax is filled into the seam, and the tube is passed slowly through a strong heat in the soldering stove, which melts the granulated brass and so unites the edges. The wires are then cut away, and the superfluous solder filed off, the tube is pickled in sulphuric acid, and again passed through the steel conductor. In the case of tubes which require great accuracy of internal gauge, a mandril or solid cylinder of steel is placed inside the tube before it is finally passed through the tool. The external pressure causes the tube to fit closely to its internal support, and while the outside takes the outline of the steel conductor, the inside is made true to the shape of the mandril. Tubes of any given section are thus formed by the use of mandrils having the outline required. Ornamental patterns are impressed on plain tubes by fitting them on mandrils and passing them through a tool, which consists of a strong iron frame carrying three or more rollers so mounted that the open space between their external edges has the sectional form of the tube to be ornamented. On the external face of these rollers is sunk the design which is to be impressed on the tube, and as it is drawn through them the powerful squeeze they give is sufficient to impress ornaments of considerable depth and boldness. Cased-tubes or rods, that is, tubes or rods of iron cased in brass, were invented in 1803 by Sir Edward Thomason, who thus described his invention:—"In watching the operation of drawing brass and copper tubes upon the mandril, I found it required as much power to slide off the hollow tube from the mandril as was required to draw it on. Reasoning from the adhesion of the brass tube to the steel mandril, I found by experiment that the union of copper and iron or brass and iron could be firmly attached by pressure, and conceived that such an application would be useful for making copper bolts for shipping, solid brass rods for stair carpets, solid brass to go round the top of a room to suspend pictures, as curtain rods for drawing-rooms, and as balustrades for staircases." Wood is cased in brass by a similar process, and used for such purposes as brass cornice-poles. Solid or seamless brass tubes, which are in very extensive demand for locomotive and other steam boilers, are made by drawing down short thick cast cylinders of brass till they reach the desired gauge and thinness. The instrument in which this drawing is accomplished is similar to the apparatus for impressing ornamental patterns on plain brass tubes. Four steel rollers are mounted in a strong frame, the sectional outline of the outer surfaces of which have the size and form to which the tube is to be drawn, and through a series of such tools the cast cylinders are passed, after annealing at each operation. Mr G. E. Muntz in 1852, patented a method of drawing tubes cast in an oval form, in the heated state.

Brass Finishing.—The operations in brass finishing comprise "dipping," "burnishing," and "lacquering," and in some cases brass-work is finished by "bronzing." After the article to be finished has been cleaned by pickling in acid, it is passed for dipping into an earthenware jar containing a solution of aquafortis (nitric acid). For bright dipping the acid is used strong, and the brass is immediately withdrawn from the bath, but for "dead" dipping, *i.e.*, for producing a bitten, frosted appearance, the bath is made weaker and the metal left in it till a creamy appearance is seen on the surface. Burnishing is accomplished by rubbing with polished steel tools, called burnishers, the parts of dead dipped work which are to be brightened. The work is then passed through water soured with acid, rinsed, and dried in boxwood sawdust. For lacquering, the work is heated over stoves, and while it is hot, a coating of varnish, made of seed-lac dissolved in spirit, is carefully

and uniformly spread over the surface. Bronzing consists in applying to the surface of the metal an opaque pigment, which alters its colour. Ordinary brassfounders' bronze consists of a solution of hydrochloric acid and ammoniac, or of the same acid, arsenic, and smithy scales. It is chiefly to cabinet brassfoundry and stamped work that such finishing processes are applied.

Vessels of brass for cooking and other domestic purposes are very extensively employed in the East Indies, and the alloy is there also a favourite material for the bangles and other personal ornaments of the lower orders. A large trade is carried on in brass wire, for ornamental purposes, between Birmingham and various African stations; a species of currency called Guinea rods, made from thick brass wire, is made and exported to the Guinea coast; and a kind of cast-brass coin, called a manilla, current in the equatorial regions of Old Calabar, is frequently supplied by Birmingham manufacturers.

(J. P.A.)

BRASSES, MONUMENTAL, a species of engraved sepulchral memorials which in the early part of the 13th century began to take the place of the tombs and effigies carved in stone, which formed such conspicuous features in most of the great churches. Made of hard *latten* or sheet brass, let into the pavement, and thus forming no obstruction in the space required for the services of the church, they speedily came into general use, and continued to be a favourite style of sepulchral memorial for three centuries. Besides their great value as historical monuments, they are specially interesting as authentic contemporary evidence of the varieties of armour and costume, or the peculiarities of palæography and heraldic designs, and they are often the only authoritative records of the intricate details of family history. Although the intrinsic value of the metal has unfortunately contributed to the wholesale spoliation of these interesting monuments, they are still found in remarkable profusion in England, and they were at one time equally common in France, Germany, and the Low Countries. In France, however, those that survived the troubles of the 16th century were totally swept away during the reign of terror, and almost the only evidence of their existence is now supplied by the collection of drawings bequeathed by Gough to the Bodleian Library. The fine memorials of the royal house of Saxony in the cathedrals of Weissen and Freiberg are the most artistic and striking brasses in Germany. Among the 13th century examples existing in German churches the full length memorials of Yso Von Welpe, bishop of Verden (1231), and of Bernard, bishop of Paderborn (1340), may be mentioned. Many fine Flemish specimens exist in Belgium, especially at Bruges. Only two or three examples, and these of late date, are known in Scotland, among which are the memorials of Alexander Cockburn (1564) at Ormiston; of the Regent Murray (1569) in the collegiate church of St Giles, Edinburgh; and of the Minto family (1605) in the south aisle of the nave of Glasgow Cathedral. England is the only country which now possesses an extensive series of these interesting memorials, of which it is calculated that there may be about 4000 still remaining in the various churches. They are most abundant in the eastern counties, and this fact has been frequently adduced in support of the opinion that they were of Flemish manufacture. But in the days when sepulchral-brasses were most in fashion the eastern counties of England were full of commercial activity and wealth, and nowhere do the engraved memorials of civilians and prosperous merchants more abound than in the churches of Ipswich, Norwich, Lynn, and Lincoln. Flemish brasses do occur in England, but they were never numerous, and they are readily distinguished from those of native workmanship. The Flemish

examples have the figures engraved in the centre of a large plate, the background filled in with diapered or scroll-work, and the inscription placed round the edge of the plate. The English examples have the figures cut out to the outline and inserted in corresponding cavities in the slab, the darker colour of the stone serving as a background. This is not an invariable distinction, however, as "figure-brasses" of Flemish origin are found both at Bruges and in England. But the character of the engraving is constant, the Flemish work being more florid in design, the lines shallower, and the broad lines cut with a chisel-pointed tool instead of the lozenge-shaped burin. It is interesting to find that the brass of Robert Hallum, bishop of Salisbury, the envoy of Henry V. to the Council of Constance, who died and was interred there in 1416, precisely resembles the brasses of England in the peculiarities which distinguish them from Continental specimens. Scarcely any of the brasses which now exist in England can be confidently referred to the first half of the 13th century, though several undoubted examples of this period are on record. The best known of the 13th century examples is that of Sir Roger de Trumpington (*circa* 1290), who accompanied Prince Edward in his expedition to Palestine, and is represented cross-legged. About half a dozen instances of this peculiarity are known. The 14th century brasses are much more numerous, and present a remarkable variety in their details. The finest specimen is that of Nicholas Lord Burnell (1315) in the church of Acton Burnell, Shropshire. The full-sized brass of Sir John d'Abernon at Stoke d'Abernon in Surrey (*circa* 1327) has the decorations of the shield filled in with a species of enamel. Other examples of this occur, and the probability is, that, in most cases, the lines of the engraving were filled with colouring-matter, though brass would scarcely bear the heat requisite to fuse the ordinary enamels. In the 15th century the design and execution of monumental brasses had attained their highest excellence. One of the best examples of plate armour is that of Sir Robert Stantoun (1458) in Castle Donnington church, Leicestershire, and one of the finest existing brasses of ecclesiastics is that of Abbot de la Mare of St Albans. It is only in the 16th century that the engraved representations become portraits. Previous to that period the features were invariably represented conventionally, though sometimes personal peculiarities were given. A large number of brasses in England are *palimpsests*, the back of an ancient brass having been engraved for the more recent memorial. Thus a brass commemorative of Margaret Bulstrode (1540) at Hedgerley, on being removed from its position, was discovered to have been previously the memorial of Thomas Totyngton, abbot of St Edmunds, Bury (1312). The abbey was only surrendered to Henry VIII. in 1539, so that before the year was out the work of spoliation had begun, and the abbot's brass had been removed and re-engraved to Margaret Bulstrode. In explanation of the frequency with which ancient brasses have thus been stolen and re-erected after being engraved on the reverse, it may be remarked that all the sheet brass used in England previous to the establishment of a manufactory at Esher by a German in 1649, had to be imported from the Continent.

See Cotman's *Engravings of the most remarkable of the Sepulchral Brasses of Norfolk, &c.* London, 1813-16; and second edition, with additional plates and notes by Meyrick, Albert Way, and Sir Harris Nicolas, 2 vols. folio, London, 1839; *Manual for the Study of Monumental Brasses*, Oxford, 1848; *Boutell's Monumental Brasses of England*, engravings on wood, folio, London, 1849; *Waller's Series of Monumental Brasses in England*, London and Oxford, Parkers, 1863.

BRASSEY, THOMAS, an eminent English railway contractor, a man remarkable for his character and abilities as well as for the vast extent and singular success of his

undertakings, was born at Baerton, near Chester, November 7, 1805. He was the son of a landed proprietor, of ancient family, and received an ordinary commercial education at a Chester school. He began his professional career at the age of sixteen as apprentice to Mr Lawton, a surveyor, and on the completion of his term became the partner of his master. Soon after his marriage his master died, and he assumed the sole management of the business. In the local surveys to which he devoted his attention during his early years he acquired the knowledge and practical experience which were the necessary foundation of his great reputation. His first engagement as railway contractor was entered upon in 1835, when, on the invitation of the distinguished engineer Joseph Locke, he undertook the execution of a portion of the Grand Junction Railway. Soon after Mr Locke entrusted him with the completion of the London and Southampton Railway, a task which involved contracts to the amount of £4,000,000 sterling and the employment of a body of 3000 men. At the same time he was engaged on portions of several other lines in the north of England and in Scotland. In conjunction with his partner, Mr W. Mackenzie, Brassey undertook, in 1840, the construction of the railway from Paris to Rouen, of which Mr Locke was engineer. He subsequently carried out the extension of the same line. A few years later he was engaged with his partner on five other French lines, and on his own account on the same number of lines in England, Wales, and Scotland. "At this time," says *The Builder*, "the industrial army set in motion and controlled by Mr Brassey amounted to 75,000 men, and his weekly payments must have distributed, as the price of labour, from £15,000 to £20,000 every Saturday. The capital involved in these various contracts amounted to some £36,000,000 sterling." But his energy and capacity were equal to still larger tasks. He undertook in 1851 other works in England and in Scotland; and in the following year he engaged in the construction of railways in Holland, Prussia, Spain, and Italy. One of his vastest undertakings was the Grand Trunk Railway of Canada, 1100 miles in length, with its astonishing bridge over the River St Lawrence. In this work he was associated with Peto and Betts. In the following years divisions of his industrial army were found in almost every country in Europe, in India, in Australia, and in South America. It must be remembered that, besides actual railway works, he originated and maintained a great number of subordinate assistant establishments, coal and iron-works, dockyards, &c., the direction of which alone would be sufficient to strain the energies of a common mind. His profits were, of course, enormous, but prosperity did not intoxicate him; and when heavy losses came, as sometimes they did, he took them bravely and quietly. Among the greatest of his pecuniary disasters were those caused by the fall of the great Barentin viaduct on the Rouen and Havre railway, and by the failure of Peto and Betts. Brassey was one of the first to aim at improving the relations between engineers and contractors, by setting himself against the corrupt practices which were common. He resolutely resisted the "scampering" of work and the bribery of inspectors, and effected what he called the "smothering of the engineer" by destroying the power of the inspectors and preventing all just grounds of dissatisfaction. Large hearted and generous to a rare degree, modest and simple in his taste and manners, he was conscious of his power as a leader in his calling, and knew how to use it wisely and for noble ends. Honours came to him unsought. The cross of the Legion of Honour was conferred on him. From Victor Emmanuel he received the cross of the Order of St Maurice and St Lazarus; and from the emperor of Austria the decoration of the Iron Crown, which it is said had not before been given to a foreigner. He died at St

Leonards at the age of 65, December 8, 1870. His life and labours are commemorated in a small volume published by Sir Arthur Helps in 1872.

BRAUNSBURG, a town of Prussia, capital of a circle in the government of Königsberg, on the Passaye, between three or four miles from its mouth in the Frische Haff. It is the seat of the Roman Catholic bishop of Ermeland, and possesses numerous Roman Catholic institutions. Of these the most important are the Lyceum Hosianum, founded in 1564 by the Cardinal Bishop Hosius, and in 1818 raised to the rank of a faculty of theology, and the deaf and dumb asylum which was established in 1811. There is also a school for the education of schoolmasters. Brewing, tanning, and weaving are the most important industries of the town, which also carries on a certain amount of trade in corn, ship timber, and yarn. The river is navigable for small vessels. Braunsberg was founded by the Teutonic knights in the middle of the 13th century. Destroyed by the Prussians in 1262 it was restored in 1279, and admitted to the Hanseatic League in 1284. After numerous vicissitudes it fell into the hands of the Poles in 1520, and in 1626 it was captured by Gustavus Adolphus. The Swedes kept possession till 1632. Population in 1871, 10,471.

BRAY, a seaport town and fashionable watering-place of Ireland, 12 miles S.S.E. of Dublin on the railway to Wexford. It is situated on both sides of the River Bray, which separates the two counties of Wicklow and Dublin, the portion in the latter county being known as Little Bray. The town is neatly built, and has a new parish church, a large Roman Catholic chapel, an old castle, a hospital, a court-house, several hotels, and Turkish baths. An esplanade runs along the shore for about a mile. The harbour admits small vessels only, and the trade is of little importance. There is a large brewery, which has been in existence for a considerable time. In the 12th century Bray was bestowed by Strongbow on Walter de Reddesford, who took the title of Baron of Bray, and built a castle in the town. It has since passed into the hands of various families. Its progress during the present century may be estimated by the gradual increase of the population—1841, 3185; 1851, 3156; 1861, 5363; 1871, 6077.

BRAY, SIR REGINALD, architect, was the second son of Sir Richard Bray, one of the privy council of Henry VI. Having been instrumental in the advancement of Henry VII to the throne of England, he was greatly in favour with that prince, who bestowed upon him honours and wealth. His taste and skill in architecture are attested by those two exquisite structures, Henry VII's chapel at Westminster and St George's chapel at Windsor. He directed the building of the former, and the finishing and decoration of the latter, to which, moreover, he was a liberal contributor. He died in 1503, and was interred in St George's chapel.

BRAY, DR THOMAS (1656–1730), was born at Marton, in Shropshire, and educated at Oxford. After leaving the university he was appointed vicar of Over-Whitacre, and rector of Sheldon. Bishop Compton sent him as his commissary to settle the affairs of the infant church of Maryland. He took a great interest in colonial missions, and busied himself in raising sums for purchasing small libraries for the use of missionaries; and to promote this design, he published his *Bibliotheca Parochialis*, and a discourse on *Apostolical Charity*. He endeavoured to establish a fund for the extension of the Christian faith, especially among the American Indians, and it is to his exertions that the Society for the Propagation of the Gospel owes its existence. He was the author of *Catechetical Lectures*, *Martyrology*, or *Papal Usurpation*, *Directorium Missionarium*, and other works.

B R A Z I L

IN presenting an account of this extensive and important country, the only American monarchy we shall give, first, a condensed view of its physical geography, meteorology, and natural products; secondly, a brief historical sketch of the progressive discovery of its coasts and interior, of its gradual settlement, and of the auspices under which its social institutions have developed themselves; and thirdly, an account of its existing political and social condition.

Brazil is bounded on the N. by Columbia or New Granada, Venezuela, and the Guianas, British, French, and Dutch; on the E. by the Atlantic; on the S. by the republics of Uruguay and the Argentine Confederation; and on the W. by Paraguay, Bolivia, Peru, and Ecuador. It extends from about 4° N. lat. to 33° 41' S. lat., and from 35° to 70° W. long. Its greatest length is about 2600 British miles, its greatest breadth about 2500; and it has a seaboard of about 4000 miles.

The original line of demarcation between the Portuguese and Spanish possessions was fixed by two bulls of Pope Alexander VI., the one of the 2d, the other of the 3d of May 1493. The kings of Castile and Portugal afterwards concluded the treaty of Torzillas, which was approved by the Pope in 1529. The reunion of the two crowns in 1580 suspended all discussions about the boundaries. They, however, recommenced after the revolution and independence of Portugal. The treaty of Utrecht in 1777 regulated many points, but the treaties always referred to rivers, mountains, and other positions passing through deserts, the names of which were not well established. For sometime past the Government of Brazil has taken great pains to establish amicably with the neighbouring states the boundary lines of the empire. In 1851 these were established with the republic of Uruguay, in 1857 with the Argentine Republic, in 1858 with Peru, in 1859 with Venezuela, in 1867 with Bolivia, and in 1872 with Paraguay; the lines determined on have in some cases been already surveyed and marked out on the actual frontier, while at present mixed commissions from Brazil and each neighbouring country are employed in tracing out the other lines agreed upon.

With Uruguay the frontier has been marked out along a line passing from the coast in 33° 41' S. lat., through the southern portion of Lake Mirim and along the River Jaguarão, which falls into it, to its most southerly source stream, thence by a line crossing the head of the Rio Negro to the dividing ridge called the Cuchilla Sta. Anna, and afterwards down the stream of the Cuarein or Quarahim to the River Uruguay.

The Uruguay River, from the mouth of the Quarahim upwards to the confluence of the Pepiry on its right bank in 27° 10' lat. divides Brazil from the Argentine Republic, the remainder of the mutual frontier of these countries being formed by the Pepiry to its source and the São Antonio from its rise to its union with the Y-Guasú or Curityba, which river marks the boundary to the Paraná.

Between Paraguay and Brazil the frontier runs from the mouth of the Y-Guasú up the Alto Paraná to the great fall of Guayrá, called Sete Quedas by the Brazilians, and from that westward along the water-parting of the Cordillera of Maracajú, southward of the basin of the Igatimi, to the heights of Amambahy, and along these to the source of the Rio Apa-Estrella, following it down hence to the Paraguay.

With Bolivia the boundary lies along the Rio Paraguay from the mouth of the Apa in 22°, upwards to 20° 11', where the Bahia Negra joins it; along the Bahia Negra, and thence in a line to the lake of Cáceres, cutting through the

midst of this lagoon, and passing onward to Lakes Mandloré, Gaiba, and Uberaba, and from the last to the south end of the ridge called Corixa Grande; from this in a direct line to Morro de Buenavista (Boavista), and to the sources of the Rio Verde; along the middle of that stream to its mouth in the Guapore, and along that river and the Mamore to the Beni, where the Madeira begins in 10° 20' S.; a direct line thence to the source of the Yavari River (found by Chandless in 1867 to be a little south of 7° S. lat.), forms the limit of Brazil with Northern Bolivia and Central Peru. The Yavari continues the boundary between Brazil and Peru down its channel to the confluence with the Amazon at Tabatinga, and the limits commission has been at work during 1874 and 1875 in determining the position of this line. Farther on, the boundary of Brazil with Northern Peru has been described as a line passing northward from Tabatinga towards the mouth of the Rio Apaporis in the River Japura, the frontier with Peru terminating on this line where it intersects the Rio Putumayo, and that with Ecuador beginning there. From the mouth of the Apaporis the continuation of the limit with Columbia or New Granada to that with Venezuela follows a line drawn along the water-parting of the range called the Collina do Guacia or Serra Aracuara, which divides the streams flowing to the Guainia, or Rio Negro, above the Casiquiare, from those which join it below the anastomosis of that natural canal. This line meets the Rio Negro about 20 miles below the separation of the Casiquiare. From the Sierra Cucuby, or Pão d'Azucar, on the opposite or left bank of the Rio Negro, the limit continues eastward over the level ground to the middle of the natural canal called the Maturacá, which in times of flood unites the Cababoris tributary of the Rio Negro with the Barria, a sub-tributary of the Casiquiare channel. Hence the limit is drawn from the Maturacá to the hill of Cupi, the first of the long range of Serras which divide the waters flowing to the Amazon from those tributary to the Orinoco, and those passing through British, Dutch, and French Guiana to the Atlantic. This boundary follows the curves of the water-parting eastward along the Serras named Guahy and Ucuruciro; northward on those of Tapirapécó and Parima; eastward again along the Merevary and Pacaraima heights; southward between the rivers Tacutu and Rupununy, and again generally eastward along the Serras of Acarahy and Tucumuraque to the source of the River Oyapok. This river, from its source to the Atlantic in 4° 22' N. lat., is the present eastward limit of French Guiana. Several islets in the Atlantic belong to Brazil; among them that of Fernando Noronha, 250 miles from Cape S. Roque, high, and having about 6 square miles of area, is important as a penal settlement of the empire.

The immense territory comprised within the line just described and the Atlantic is upwards of 3,288,000 English square miles in area, or not far short of the extent of Europe.

The great river of the lowlands of Brazil, the Amazon, has been called the Mediterranean of South America, and is the largest stream of the globe in every respect, affording, with its great tributaries, free navigation over not less than 30,000 miles within Brazilian territory (see AMAZON).

After the Amazon the Tocantins is the great river of the northern watershed of Brazil. Rising in the Serra das Vertentes in Central Brazil, the Araguaya, its longer head stream, and the Tocantins flow northward for 900 miles, separated by the Cordillera Grande of Goyaz, and unite at about 300 miles from their wide estuary, called the Rio Pará, formed between the island of Maraio and the main-