49,312; France, 37,156; Algeria, 20,478; Italy, 12,061; Holland, 3,218, — a total of 2,106,213 acres.

The consumption of tobacco in the United Kingdom is large and progressive, and the revenue derived from it last year was nearly $43,750,000. The average consumption is largest in Holland, — nearly 7 pounds per head; in the United States, about 4½ pounds; in Hungary, Denmark, Belgium, and Germany, from 3 to 3¾ pounds. In the Australian colonies it is also high, — 3½ pounds; in France it is about 2 pounds; and in the United Kingdom, under 1½ pounds.

The yearly production of tobacco in Cuba is about 300,000 bales, and 181,000,000 cigars are also exported. The Spaniards have hitherto monopolized the trade in cigars, alleging that parts of the soil of Cuba were alone suited to the production of Havana tobacco. This assertion is now disproved, for with good choice of seed, soil, and leaf, and skilled manufacture, Jamaica is said now to send into the market as excellent a cigar as was ever shipped from Havana, and at a far cheaper rate. In the Philippines 100,000 hundredweights of tobacco are produced. The Dutch possessions in the Eastern Archipelago ship a large quantity of excellent tobacco, which is held in high repute in Europe. The imports of Sumatra tobacco in Holland now average 140,000 bales; and of Java tobacco, 130,000 bales.

Although there are about fifty species of the genus *Nicotiana* known, only three or four are much cultivated for the leaf. The two principal commercial forms are by some botanists treated as varieties, and not as distinct species. These are *N. tabacum*, the most extensively cultivated kind of plant, which may be at once recognized by its longish pink flowers and tapering oval-lanceolate sessile leaves; and *N. rustica*, which has short greenish flowers, and stalked ovate, cordate leaves. The leaves are coarser and more crumpled than those of the preceding. This is popularly known as the Turkish form, but is most probably a native of Mexico and California. *N. repanda* is not very extensively cultivated, but is said to yield some of the finest qualities of Cuban tobacco. *N. Persica* furnishes the Persian or Shiraz tobacco. *N. angustifolia*, a species found in Chili, yields a very strong tobacco.

The West Indian, Latakia, and American tobaccos are obtained from cultivated plants of *N. tabacum;* while the Manila, Turkish, and Hungarian are reported to be derived from *N. nistica*. In India *N. rustica* is only cultivated to a very limited extent, and chiefly in eastern Bengal and Cachar, and the leaf is never exported to Europe. *N. tabacum* has become an abundant weed in many parts of India. The gross annual value of the tobacco harvest in Bengal may be roughly estimated at $10,000,000, but the quantity exported is small, averaging only $65,000 in value.

Of the species, *N. macrophylla* is considered to possess the qualities that distinguish a good tobacco in the highest degree. Some of the Havana tobaccos belong to this species. Madras, where the climate is admirably suited for the growth of tobacco, stands first with regard to the development of this industry in India. Dinnigul is the great tobacco district, and cheroots are manufactured at Trichinopoli. The islands in the delta of the Godavery also yield what is called Lunk tobacco, the climate being suitable; and the plants are raised in rather poor light soil, highly manured and well watered. No better evidence could be afforded of the universal use of this plant than the extensive display which was made of it in every section of the Paris Exhibition; and although most of the cases were under seal of the customs, yet many of the kiosks were privileged to sell, such as the Dutch, Belgian, Spanish, Mexican, etc., although the sale and manufacture is a government monopoly in France, and licenses are only granted to privileged people.

WHAT STANLEY HAS DONE FOR THE MAP OF AFRICA.[1]

IT is nineteen years this month since Stanley first crossed the threshold of Central Africa. He entered it as a newspaper correspondent to find and succor Livingstone, and came out burning with the fever of African exploration. While with Livingstone at Ujiji he tried his 'prentice hand at a little exploring work, and between them they did something to settle the geography of the north end of Lake Tanganyika. Some three years and a half later he was once more on his way to Zanzibar, this time with the deliberate intention of doing something to fill up the great blank that still occupied the centre of the continent. A glance at the first of the maps which accompany this paper will afford some idea of what Central Africa was like when Stanley entered it a second time. The ultimate sources of the Nile had yet to be settled. The contour and extent of Victoria Nyanza were of the most uncertain character. Indeed, so little was known of it beyond what Speke told us, that there was some danger of its being swept off the map altogether, not a few geographers believing it to be not one lake, but several. There was much to do in the region lying to the west of the lake, even though it had been traversed by Speke and Grant. Between a line drawn from the north end of Lake Tanganyika to some distance beyond the Albert Nyanza on one side, and the west coast region on the other, the map was almost white, with here and there the conjectural course of a river or two. Livingstone's latest work, it should be remembered, was then almost unknown, and Cameron had not yet returned. Beyond the Yellala Rapids there was no Kongo, and Livingstone believed that the Lualaba swept northwards to the Nile. He had often gazed longingly at the broad river during his weary sojourn at Nyangwé, and yearned to follow it, but felt himself too old and exhausted for the task. Stanley was fired with the same ambition as his dead master, and was young and vigorous enough to indulge it.

What, then, did Stanley do to map out the features of this great blank during the two years and nine months which he spent in crossing from Bagamoyo to Boma, at the mouth of the Kongo? He determined, with an accuracy which has since necessitated but slight modification, the outline of the Victoria Nyanza; he found it to be one of the great lakes of the world, 21,500 square miles in extent, with an altitude of over 4,000 feet, and border soundings of from 330 to 580 feet. Into the south shore of the lake a river flowed, which he traced for some 300 miles, and which he set down as the most southerly feeder of the Nile. With his stay at the court of the clever and cunning Mtesa of Uganda we need not concern ourselves; it has had momentous results. Westwards he came upon what he conceived to be a part of the Albert Nyanza, which he named Beatrice Gulf, but of which more anon. Coming southwards to Ujiji, Stanley filled in many features in the region he traversed, and saw at a distance a great mountain, which he named Gordon Bennett, of which also more anon. A little lake to the south he named Alexandra Nyanza; thence he conjectured issued the south-west source of the Nile, but on this point, within the last few months, he has seen cause to change his mind. Lake Tanganyika he circumnavigated, and gave greater accuracy to its outline; while through the Lukuga he found it sent its waters by the Lualaba to the Atlantic. Crossing to Nyangwé, where with longing eyes Livingstone beheld the mile-wide Lualaba flowing "north, north, north," Stanley saw his opportunity, and embraced it. Tippo-Tip failed him then, as he did later; but the mystery of that great river he had made up his mind to solve, and solve it he did. The epic of that first recorded journey of a white man down this majestic river, which for ages had been sweeping its unknown way through the centre of Africa, he and his dusky companions running the gauntlet through a thousand miles of hostile savages, is one of the most memorable things in the literature of travel. Leaving Nyangwé on Nov. 5, 1876, in nine months he traced the many-islanded Kongo to the Atlantic, and placed on the map of Africa one of its most striking features. For the Kongo ranks among the greatest rivers of the world. From the remote Chambeze that enters Lake Bangweolo to the sea, it is 3,000 miles. It has many tributaries, themselves affording hundreds of miles of navigable drains; waters a basin of a million square miles, and pours into the Atlantic a volume estimated at 1,800,000 cubic feet per second. Thus, then, were the first broad lines drawn towards filling up the great blank. But, as we know, Stanley two years later was once more on his way to the Kongo, and shortly after, within the compass of its great basin, he helped to found the Kongo Free State. During the years he was officially connected with the river, either directly or through those who served under him, he went on filling up the blank by the exploration of other rivers,

[1] J. Scott Keltie, in Contemporary Review, January, 1890.

north and south, which poured their voluminous tribute into the main stream; and the impulse he gave has continued. The blank has become a network of dark lines, the interspaces covered with the names of tribes and rivers and lakes.

Such then, briefly, is what Stanley did for the map of Africa during his great and ever-memorable journey across the continent. Once more Mr. Stanley has crossed the continent, in the opposite direction, and taken just about the same time in which to do so. Discovery was not his main object this time, and therefore the results in this direction have not been so plentiful. Indeed, they could not be; he had left so comparatively little to be done. But the additions that he has made to our knowledge of the great blank are considerable, and of high importance in their bearing on the hydrography, the physical geography, the climate, and the people of Central Africa.

Let us rapidly run over the incidents of this, in some respects, the most remarkable expedition that ever entered Africa. Its first purpose, as we know, was to relieve, and if necessary bring away, Emin Pacha, the governor of the abandoned Equatorial Province of the Egyptian Sudan, which spread on each side of the Bahr-el-Jebel, the branch of the Nile that issues from the Albert Nyanza. Here it was supposed that he and his Egyptian officers and troops, and their wives and children, were beleaguered by the Mahdist hordes, and that they were at the end of their supplies. Emin Pacha, who as Eduard Schnitzer was born in Prussian Silesia, and educated at Breslau and Berlin as a physician, spent twelve years (1864–1876) in the Turkish service, during which he travelled over much of the Asiatic dominions of Turkey, indulging his strong tastes for natural history. In 1876 he entered the service of Egypt, and was sent up to the Sudan as surgeon on the staff of Gordon Pacha, who at that time governed the Equatorial Province. In 1878, two years after Gordon had been appointed governor-general of the whole Sudan, Emin Effendi (he had Moslemized himself) was appointed governor of the Equatorial Province, which he found completely disorganized and demoralized, the happy hunting-ground of the slave-raider. Within a few months Emin had restored order, swept out the slavers, got rid of the Egyptian scum who pretended to be soldiers, improved the revenue, so that instead of a large deficit there was a considerable surplus, and established industry and legitimate trade. Meantime the Mahdi had appeared, and the movement of conquest was gathering strength. It was not, however, till 1884 that Emin began to fear danger. It was in January of that year that Gordon went out to hold Khartoum; just a year later both he and the city fell before the Mahdist host. Emin withdrew with his officers and dependents, numbering probably about fifteen hundred, to Wadelai, in the south of the province, within easy reach of Albert Nyanza.

Rumors of the events in the Sudan after the fall of Khartoum reached this country; but no one outside of scientific circles seemed to take much interest in Emin till 1886. Rapidly, however, Europe became aware what a noble stand this simple *savant*, who had been foisted into the position of governor of a half-savage province, was making against the forces of the Mahdi, and how he refused to desert his post and his people. Towards the autumn of 1886 public feeling on the subject rose to such a height that the British Government, which was held to blame for the position in the Sudan, was compelled to take action. Our representative at Zanzibar, as early as August of that year, instituted inquiries as to the possibility of a relief expedition, but in the end, in dread of international complications, it was decided that a government expedition was impracticable. In this dilemma, Sir (then Mr.) William Mackinnon, chairman of the British India Steam Navigation Company, whose connection with East Africa is of old standing, came forward and offered to undertake the responsibility of getting up an expedition.

The Emin Pacha Relief Committee was formed in December, 1886, and government did all it could to aid, short of taking the actual responsibility. Mr. H. M. Stanley generously offered his services as leader, without fee or reward, giving up many lucrative engagements for the purpose. No time was lost. The sum of £20,000 had been subscribed, including £10,000 from the Egyptian Government. Mr. Stanley returned from America to England in the end of December; by the end of January he had made all his preparations, selecting nine men as his staff, including three English officers and two surgeons, and was on his way to Zanzibar, which was reached on Feb. 21. On the 25th the expedition was on board the "Madura," bound for the mouth of the Kongo, by way of the Cape: nine European officers, sixty-one Sudanese, thirteen Somalis, three interpreters, 620 Zanzibaris, the famous Arab slaver and merchant, Tippo-Tip, and 407 of his people.

The mouth of the Kongo was reached on March 18; there the expedition was transshipped into small vessels, and landed at Matadi, the limit of navigation on the lower river. From Matadi there was a march of 200 miles, past the cataracts to Stanley Pool, where the navigation was resumed. The troubles of the expedition began on the Kongo itself.

The question of routes was much discussed at the time of organizing the expedition, the two that found most favor being that from the east coast through Masai-land and round by the north of Uganda, and that by the Kongo. Into the comparative merits of these two routes we shall not enter here. For reasons which were satisfactory to himself, — and no one knows Africa better, — Mr. Stanley selected the Kongo route; though had he foreseen all that he and his men would have to undergo he might have hesitated. As it was, the expedition, which it was thought would be back in England by Christmas, 1887, only reached the coast in November, 1889. But the difficulties no one could have foreseen, the region traversed being completely unknown, and the obstacles encountered unprecedented even in Africa. Nor, when the goal was reached, was it expected that months would be wasted in persuading Emin and his people to quit their exile. Not the keenest-eyed of African explorers could have foreseen all this.

Want of sufficient boat accommodation, and a scarcity of food almost amounting to famine, hampered the expedition terribly on its way up the Kongo. The mouth of the Aruvimi, the real starting-point of the expedition, some 1,500 miles from the mouth of the Kongo, was not reached by Mr. Stanley and the first contingent till the beginning of June, 1887. The distance from here in a straight line to the nearest point of the Albert Nyanza is about 450 miles; thence it was believed communication with Emin would be easy, for he had two steamers available. But it was possible that a détour would have to be made towards the north so as to reach Wadelai direct, for no one knew the conditions which prevailed in the country between the Aruvimi mouth and the Albert Nyanza. As it was, Mr. Stanley took the course to the lake direct, but with many a circuit and many an obstruction, and at a terrible sacrifice of life. An intrenched camp was established on a bluff at Yambuya, about fifty miles up the left bank of the Aruvimi. Major Barttelot was left in charge of this, and with him Dr. Bonny, Mr. Jameson, Mr. Rose Troup, Mr. Ward, and 257 men; the rear column was to follow as soon as Tippo-Tip provided the contingent of five hundred natives which he had solemnly promised. Although the whole of the men had not come up, yet every thing seemed in satisfactory order; explicit instructions were issued to the officers of the rear column; and on June 28, 1887, Mr. Stanley, with a contingent consisting of 389 officers and men, set out to reach Emin Pacha. The officers with him were Captain Nelson, Lieutenant Stairs, Dr. Parke, and Mr. Jephson.

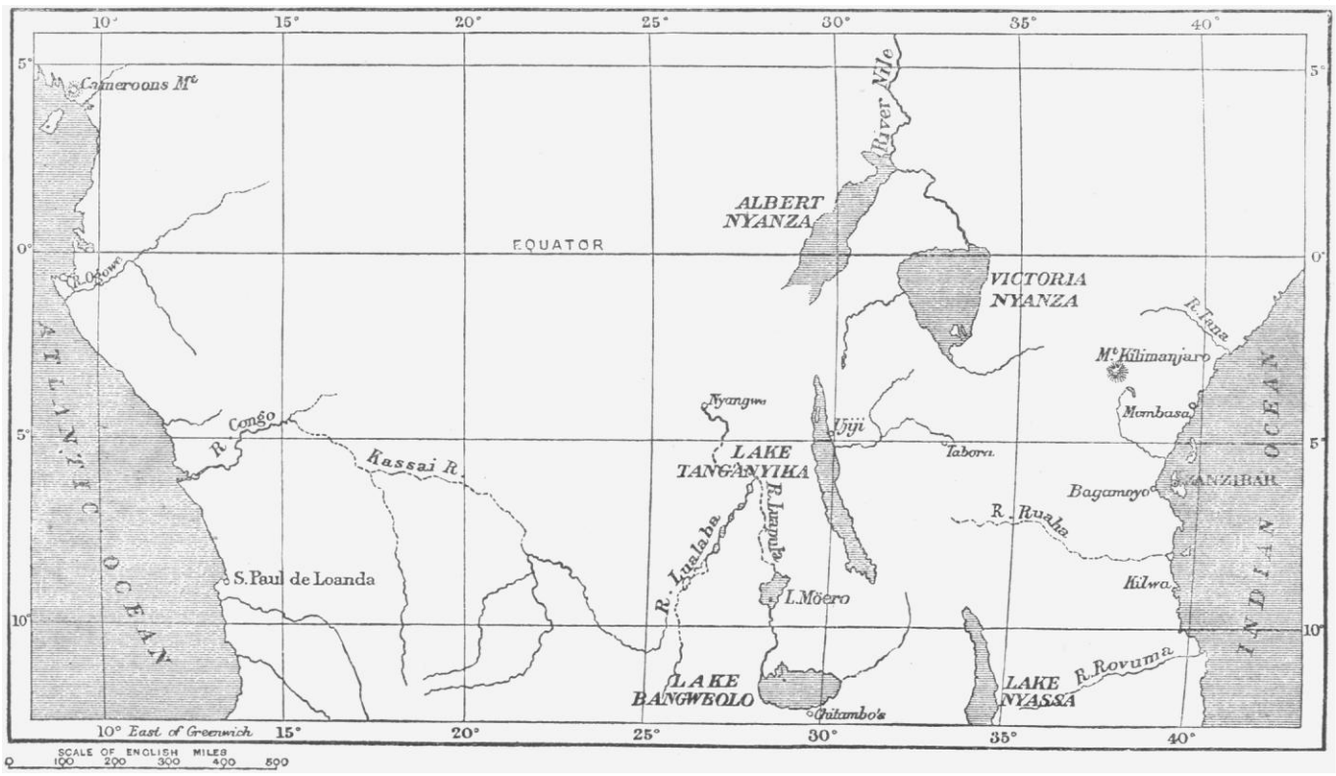
Five miles after leaving camp the difficulties began. The expedition was face to face with a dense forest of immense extent, choked with bushy undergrowth, and obstructed by a network of creepers through which a way had often to be cleaved with the axes. Hostile natives harassed them day after day; the paths were studded with concealed spikes of wood; the arrows were poisoned; the natives burned their villages rather than have dealings with the intruders. Happily the river, when it was again struck, afforded relief, and the steel boat proved of service, though the weakened men found the portages past the cataracts a great trial. It was fondly hoped that here at least the Arab slaver had not penetrated; but on Sept. 16 two hundred miles from Yambuya, making 340 miles of actual travel, the slave camp of Ugarowwa was reached, and here the treatment was even worse than when fighting the savages of the forest. The brutalities practised on Stanley's men cost many of them their lives. A month later the camp of another Arab slaver was reached, Kilinga Longa, and there the treatment was no better. These so-called Arabs, whose

caravans consist mainly of the merciless Manyuema, from the country between Tanganyika and Nyangwé, had laid waste a great area of the region to be traversed by the expedition, so that between Aug. 31 and Nov. 12 every man was famished; and when at last the land of devastation was left behind, and the native village of Ibwiri entered, officers and men were reduced to skeletons. Out of the 389 who started, only 174 entered Ibwiri, the rest dead, or missing, or left behind, unable to move, at Ugarowwa's. So weak was everybody that seventy tons of goods and the boat had to be left at Kilinga Longa's with Captain Nelson and Surgeon Parke.

A halt of thirteen days at Ibwiri, with its plenty of fowls, bananas, corn, yams, beans, restored everybody; and 173 sleek and robust men set out for the Albert Nyanza on Nov. 24. A week later the gloomy and dreaded forest suddenly ended; the open country was reached; the light of day was unobstructed; it was an emergence from darkness to light. But the difficulties were not over; some little fighting with the natives on the populous plateau was necessary before the lake could be reached. On the 12th the edge of the long slope from the Kongo to Lake Albert was attained, and suddenly the eyes of all were gladdened by the sight of the lake lying some three thousand feet almost sheer below. The expedition itself stood at an altitude of 5,200 feet above the sea. But the end was not yet. Down the expedition marched to the south-west corner of the lake, where the Kakongo natives were unfriendly. No Emin Pacha had been heard of; there was no sign even that he knew of Stanley's coming, or that the messenger from Zanzibar had reached him. The only boat of the expedition was at Kilinga Longa's, 190 miles away. Of the men, 94 were behind sick at Ugarowwa's and Kilinga Longa's; only 173 were with Stanley; 74 of the original 341 were dead or missing; and, moreover, there was anxiety about the rear column.

Stanley's resolution was soon taken. Moving to the village of Kavalli, some distance up the steep slope from the lake, the party began a night march on Dec. 15, and by Jan. 7 they were back at Ibwiri. Here Fort Bodo, famous in the records of the expedition, was built. The men were brought up from the rear, and on April 7 Stanley, with Jephson and Parke, once more led the expedition to Lake Albert, this time with the boat and fresh stores. Meantime, Stanley himself was on the sick-list for a month. This time all the natives along the route were friendly and even generous, and on April 22 the expedition reached the chief Kavalli, who delivered to Stanley a letter wrapped in American cloth. The note was from Emin, and stated that he had heard rumors of Stanley's presence in the district; it begged Stanley to wait until Emin could communicate with him. The boat was launched, and Jephson set off to find Emin. On the 29th the "Khedive" steamer came down the lake with Emin, the Italian Casati, and Jephson on board. The great object of the expedition seemed at last to be all but fulfilled.

But the end was not yet. There was the party at Fort Bodo; there were the sick further back with whom Lieutenant Stairs had not returned when Stanley left the fort; and, above all, there was the rear column left at Yambuya with Major Barttelot. It would take some time for Emin to bring down all his people from Wadelai and other stations. So after spending over three weeks with the vacillating Emin, Stanley, on May 25, was once more on the march back to Fort Bodo to bring up all hands. He left Jephson, three Sudanese, and two Zanzibaris with Emin, who gave him 102 natives as porters, and three irregulars to accompany him back.



CENTRAL AFRICA, BEFORE STANLEY.

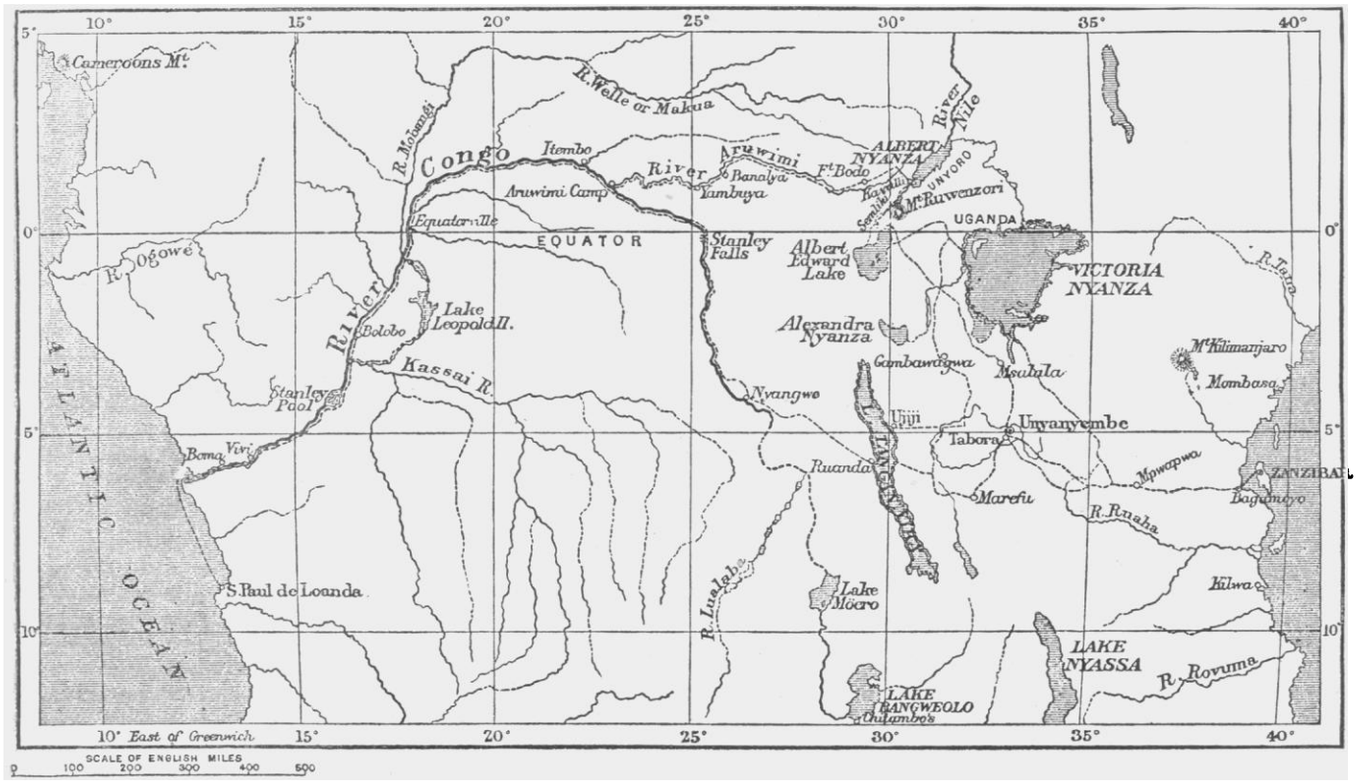
Fort Bodo was reached on June 8, and was found in a flourishing state, surrounded by acres of cultivated fields. But of the fifty-six men left at Ugarowwa's only sixteen were alive for Lieutenant Stairs to bring to Fort Bodo. As there was no sign of the rear column nor of the twenty messengers sent off in March with letters for Major Barttelot, Stanley felt bound to retrace his steps through the terrible forest. This time he was better provisioned, and his people (212) escaped the horrors of the wilderness.

Fort Bodo was left on June 16, Stanley letting all his white companions remain behind. Ugarowwa's camp was deserted, and he himself, with a flotilla of fifty-seven canoes, was overtaken far down the river on Aug. 10, and with him seventeen of the carriers sent off to Major Barttelot in March; three of their number had been killed. On the 17th the rear column was met with at Bonalya, eighty miles above Yambuya, and then for the first time Stanley learned of the terrible disaster that had befallen it — Barttelot shot by the Manyuema, Jameson gone down the Kongo (only to die), Ward away, and Troup invalided home. No one but Dr. Bonny: of the 257 men only seventy-two remaining, and of these only fifty-two fit for service. No wonder Mr. Stanley felt too sick to write the details; and until we have the whole of the evidence it would

be unfair to pronounce judgment. One thing we may say: we know, from Mr. Werner's recently published "River Life on the Congo," that before Major Barttelot left Yambuya to follow Stanley it was known to Mr. Werner, to more than one Belgian officer, to several natives, and to the Manyuema people with Barttelot, that instructions had been given by Tippo-Tip to these last to shoot Major Barttelot if he did not treat them well. Yet no one cared to warn the major, and he was allowed to depart to his almost certain fate. The thing is too sickening to dwell upon. It was at this stage that Stanley sent home his first letters, which reached England on April 1, 1889, twenty months after he started from the Aruvimi, and over two years after he left England. The relief was intense; all sorts of sinister rumors had been floated, and most people had given up the expedition for lost.

Once more back through the weary forest, with the expedition re-organized. A new route was taken to the north of the river through a region devastated by the Arab slavers; and here the expedition came near to starvation, but once more Fort Bodo was reached, on Dec. 20. Here things were practically as Stanley had homeward march was comparatively free from trouble, and full of interest; and on Dec. 6 Mr. Stanley once more entered Zanzibar, which he had left two years and ten months before. Such briefly are some of the incidents of the rescue expedition; let us now as briefly sum up the geographical results.

When Stanley left for Africa in January, 1887, there remained one of the great problems of African hydrography still unsolved, what is known as the problem of the Wellé. Schweinfurth and Junker had come upon a river at some points which seemed to rise in the neighborhood of the Albert Nyanza, and appeared to flow in a north-west direction. The favorite theory at the time was that the river Wellé was really the upper course of the Shari, which runs into Lake Chad far away to the north-west. But as the Kongo and its great feeders on the north, and the lay of the land in that direction, became better known, it began to be conjectured that after all the Wellé might send its waters to swell the mighty volume of the great river. Stanley, I know, hoped that, among other geographical work, he might be able to throw some light on the course of this puzzling river. But, as we see now, the



CENTRAL AFRICA, AFTER STANLEY.

left them; there was no sign of Emin, though he had promised to come to the fort. The combined expedition marched onwards, and Mr. Stanley, pushing on with a contingent, reached the lake for the third time, on Jan. 18, only to learn that Emin and Jephson had been made prisoners by Emin's own men; the Mahdists had attacked the station and created a panic, and all was disorganization and vacillation. At last, however, the chief actors in this strange drama were together again: and Mr. Stanley's account of Emin's unstable purpose; the long arguments with the Pacha to persuade him to come to a decision; the ingratitude and treachery of the Egyptians; the gathering of the people and their burdensome goods and chattels preparatory to quitting the lake, — these and many other details are fresh in our memories from Stanley's own letters. But the main purpose of the expedition was accomplished, at however terrible a cost, and however disappointing it was to find that after all Emin was reluctant to be "rescued." When the start was made from Kavalli's, on April 10 last, fifteen hundred people in all were mustered. An almost mortal illness laid Stanley low for a month shortly after the start, and it was May 8 before the huge caravan was fairly under way. Some fighting had to be done with the raiders from Unyoro, but on the whole the cares and troubles that fell upon him prevented him going much out of the way to do geographical work. While, however, Stanley was cleaving his way through the tangled forest, Lieutenant Van Géle, one of the Free State officers, proved conclusively that the Wellé was really the upper course of the Mobangi, one of the largest northern tributaries of the Kongo. But another and kindred problem Stanley was able to solve. Before his journey, the mouth of the river Aruvimi was known; the great naval battle which he fought there on his first descent of the river is one of the most striking of the many striking pictures in the narrative of that famous journey. But beyond Yambuya its course was a blank. The river, under various names, "Ituri" being the best known, led him almost to the brink of the Albert Nyanza. One of its upper contributories is only ten minutes' walk from the brink of the escarpment that looks down upon the lake. With many rapids, it is for a great part of its course over five hundred yards wide, with groups of islands here and there. For a considerable stretch it is navigable, and its entire length, taking all its windings into account, from its source to the Kongo, is eight hundred miles. One of its tributaries turns out to be another river which Junker met farther north, and whose destination was a puzzle, the Nepoko.

Thus this expedition has enabled us to form clearer notions of the hydrography of this remarkable region of rivers. We see that the sources of the Kongo and the Nile lie almost within a few yards of each other. Indeed, so difficult is it to determine to which river the various waters in this region send their tribute, that Mr. Stanley himself, in his first letter, was confident that the southern Lake Albert belonged to the Kongo, and not to the Nile system; it was only actual inspection that convinced him he was mistaken. How it is that the Ituri or the Aruvimi and other rivers in the same region are attracted to the Kongo and not to the Nile is easily seen from Mr. Stanley's graphic description of the lay of the country between the Kongo and the Albert Nyanza. It is, he says, like the glacis of a fort, some 350 miles long, sloping gradually up from the margin of the Kongo (itself at the Aruvimi mouth 1,400 feet above the sea), until ten minutes beyond one of the Ituri feeders it reaches a height of 5,200 feet, to descend almost perpendicularly 2,900 feet to the surface of the lake, which forms the great western reservoir of the Nile.

But when the term "glacis" is used, it must not be inferred that the ascent from the Kongo to Lake Albert is smooth and unobstructed. The fact is that Mr. Stanley found himself involved in the northern section of what is probably the most extensive and densest forest region in Africa. Livingstone spent many a weary day trudging its gloomy recesses away south at Nyangwé on the Lualaba. It stretches for many miles north to the Monbuttu country. Stanley entered it at Yambuya, and tunnelled his way through it to within fifty miles of the Albert Nyanza, when it all of a sudden ceased and gave way to grassy plains and the unobstructed light of day. How far west it may extend beyond the Aruvimi he cannot say; but it was probably another section of this same forest region that Mr. Paul du Chaillu struck some thirty years ago, when gorilla-hunting in the Gaboon. Mr. Stanley estimates the area of this great forest region at about three hundred thousand square miles, which is more likely to be under than over the mark. The typical African forest, as Mr. Drummond shows in his charming book on "Tropical Africa," is not of the kind found on the Aruvimi, which is much more South American than African. Not even in the "great sponge" from which the Zambesi and the Kongo draw their remote supplies do we meet with such impenetrable density. Trees scattered about as in an English park in small open clumps form, as a rule, the type of "forest" common in Africa; the physical causes which led to the dense packing of trees over the immense area between the Kongo and Nile lakes will form an interesting investigation. Mr. Stanley's description of the great forest region, in his letter to Mr. Bruce, is well worth quoting: —

"Take a thick Scottish copse, dripping with rain; imagine this copse to be a mere undergrowth, nourished under the impenetrable shade of ancient trees, ranging from 100 to 180 feet high; briers and thorns abundant; lazy creeks meandering through the depths of the jungle, and sometimes a deep affluent of a great river. Imagine this forest and jungle in all stages of decay and growth — old trees falling, leaning perilously over, fallen prostrate; ants and insects of all kinds, sizes, and colors murmuring around; monkeys and chimpanzees above, queer noises of birds and animals, crashes in the jungle as troops of elephants rush away; dwarfs with poisoned arrows securely hidden behind some buttress or in some dark recess; strong, brown-bodied aborigines with terribly sharp spears, standing poised, still as dead stumps; rain pattering down on you every other day in the year; an impure atmosphere, with its dread consequences, fever and dysentery; gloom throughout the day, and darkness almost palpable throughout the night; and then if you will imagine such a forest extending the entire distance from Plymouth to Peterhead, you will have a fair idea of some of the inconvenience endured by us from June 28 to Dec. 5, 1887, and from June 1, 1888, to the present date, to continue again from the present date till about Dec. 10, 1888, when I hope then to say a last farewell to the Kongo Forest."

Mr. Stanley tries to account for this great forest region by the abundance of moisture carried over the continent from the wide Atlantic by the winds which blow landward through a great part of the year. But it is to be feared the remarkable phenomenon is not to be accounted for in so easy a way. Investigation may prove that the rain of the rainiest region in Africa comes not from the Atlantic, but the Indian Ocean, with its moisture-laden monsoons. And so we should have here a case analogous to that which occurs in South America, the forests of which resemble in many features those of the region through which Mr. Stanley has passed.

But the forest itself is not more interesting than its human denizens. The banks of the river in many places are studded with large villages, some, at least, of the native tribes being cannibals. We are here on the northern border of the true negro peoples, so that when the subject is investigated the Aruvimi savages may be found to be much mixed. But unless Europe promptly intervenes, there will shortly be few people left in these forests to investigate. Mr. Stanley came upon two slave-hunting parties, both of them manned by the merciless people of Manyuema. Already great tracts have been turned into a wilderness, and thousands of the natives driven from their homes. From the ethnologist's point of view the most interesting inhabitants of the Aruvimi forests are the hostile and cunning dwarfs, or rather pygmies, who caused the expedition so much trouble. No doubt they are the same as the Monbuttu pygmies found farther north, and essentially similar to the pygmy population found scattered all over Africa, from the Zambesi to the Nile, and from the Gaboon to the east coast. Mr. Du Chaillu found them in the forests of the west thirty years ago, and away south on the great Sankuru tributary of the Kongo Major Wissmann and his fellow-explorers met them within the past few years. They seem to be the remnants of a primitive population rather than stunted examples of the normal negro. Around the villages in the forest, wherever clearings had been made, the ground was of the richest character, growing crops of all kinds. Mr. Stanley has always maintained that in the high lands around the great lakes will be found the most favorable region for European enterprise; and if in time much of the forest is cleared away, the country between the Kongo and Lake Albert might become the granary of Africa.

To the geographer, however, the second half of the expedition's work is fuller of interest than the first. Some curious problems had to be solved in the lake region, problems that have given rise to much discussion. When in 1864 Sir Samuel Baker stood on the lofty escarpment that looks down on the east shore of the Albert Nyanza, at Vacovia, the lake seemed to him to stretch illimitably to the south, so that for long it appeared on our maps as extending beyond 1° south latitude. When Stanley, many years later, on his first great expedition, after crossing from Uganda, came upon a great bay of water, he was naturally inclined to think that it was a part of Baker's lake, and called it Beatrice Gulf. But Gessi and Mason, members of Gordon Pacha's staff, circumnavigated the lake later on, and found that it ended more than a degree north of the equator. So when Stanley published his narrative he made his "Beatrice Gulf" a separate lake lying to the south of the Albert Nyanza. Mr. Stanley saw only a small portion of the southern lake, Muta Nzigé, but in time it expanded and expanded on our maps, until there seemed some danger of its being joined on to Lake Tanganyika. Emin himself, during his twelve years' stay in the Sudan, did something towards exploring the Albert Nyanza, and found that its southern shore was fast advancing northwards, partly owing to sediment brought down by a river, and partly due to the wearing away of the rocky bed of the Upper Nile, by which much water escaped, and the level of the lake subsided. Thus, when Baker stood on the shore of the lake in 1864, it may well have extended many miles farther south than it does now. But where did the river come from that Mason and Emin saw running into the lake from the south? As was pointed out above, Stanley at first thought it could not come from his own lake to the south, which he believed must send its waters to the Kongo. But all controversy has now been ended. During the famous exodus of the fifteen hundred from Kavalli to the coast, the intensely interesting country lying between the northern lake, Albert, and the southern lake, now named Albert Edward, was traversed. Great white grassy plains stretch away south from the shores of Lake Albert, which under the glitter of a tropical sun might well be mistaken for water; evidently they have been under water at a quite recent period. But soon the country begins to rise, and round the base of a great mountain boss the river Semliki winds

its way through its valley, receiving through the picturesque glens many streams of water from the snows that clothe the mountain-tops. Here we have a splendid country, unfortunately harassed by the raids of the Wanyoro, in dread of whom the simple natives of the mountain-side often creep up to near the limit of snow. Up the mountain, which Lieutenant Stairs ascended for over ten thousand feet, blackberries, bilberries, violets, heaths, lichens, and trees that might have reminded him of England flourish abundantly. Here evidently we have a region that might well harbor a European population. The mountain itself, Ruwenzori, a great boss with numerous spurs, is quite evidently an extinct volcano, rising to something like nineteen thousand feet, and reminding one of Kilima Njaro, farther to the east. It is not yet clear whether it is the same mountain as the Gordon Bennett seen by Stanley in his former expedition, though the probability is that, if distinct, they belong to the same group or mass. Apart from the mountain the country gradually ascends as the Semliki is traced up to its origin in Lake Albert Edward. Mr. Stanley found that, after all, the southern Nyanza belongs to the great Nile system, giving origin to the farthest south-west source of Egypt's wonderful river, which we now know receives a tribute from the snows of the equator.

The southern lake itself is of comparatively small dimensions, probably not more than forty-five miles long, and is nine hundred feet above the northern Lake Albert. Mr. Stanley only skirted its west, north, and east shores, so that probably he has not been able to obtain complete data as to size and shape. But he has solved one of the few remaining great problems in African geography. The two lakes lie in a trough, the sides of which rise steeply in places three thousand feet, to the great plateaus that extend away east and west. This trough, from the north end of Lake Albert to the south end of Lake Albert Edward, is some two hundred and sixty statute miles in length. About one hundred miles of this is occupied by the former lake, forty-five by the latter, and the rest by the country between, where the trough, if we may indulge in an Irishism, becomes partly a plain, and partly a great mountain mass. But this trough, or fissure, a glance at a good map will show, is continued more or less south and south-east in Lakes Tanganyika and Nyassa, which are essentially of the same character as Lakes Albert and Albert Edward, and totally different from such lakes as Victoria Nyanza and Bangweolo. Here we have a feature of the greatest geographical interest, which still has to be worked out as to its origin.

There is little more to say as to the geographical results of the Emin Pacha Relief Expedition. There are many minute details of great interest, which the reader may see for himself in Mr. Stanley's letters, or in his forthcoming detailed narrative. In his own characteristic way, he tells of the tribes and peoples around the lakes, and between the lakes and the coast; and it was left for him on his way home to discover a great south-west extension of Victoria Nyanza, which brings that lake within one hundred and fifty miles of Lake Tanganyika. The results which have been achieved have been achieved at a great sacrifice of life and of suffering to all concerned; but no one, I am sure, will wish that the work had been left undone. The few great geographical problems in Africa that Livingstone had to leave untouched, Stanley has solved. Little remains for himself and others in the future beyond the filling-in of details; but these are all-important, and will keep the great army of explorers busy for many years, if not for generations.

USEFUL PLANTS IN GUATEMALA.

IN a report on the trade, commerce, and industries of the Republic of Guatemala for 1888, the British Consul to that republic draws attention to the various vegetable products cultivated in the country. Coffee is described as the most important agricultural product, and, from its excellent quality, fetches a high price in the market. The area of land planted has possibly doubled in the last few years, and owing to failure in the last year's crop in Brazil, and the consequent rise in the value of the product, an unusually large acreage of fresh land is now being planted, and greater care taken with the present estates, many old plantations being renewed and added to. It is expected that next year, or the year after, 1,000,000 quintals will be produced, bringing, exclusive of consumption, a wealth of $11,500,000 to $12,500,000 to the country. There is still a quantity of good land available for purchase. Sowing is generally done in June; and when about seven inches high, the young plants are transplanted into nurseries, watered in the dry season, and protected from the sun until ready to be planted out. About 100,000 quintals of coffee are yearly consumed in the country.

Sugar stands next among the most important vegetable products. Cacao cultivated in Guatemala is of superior quality, and at one time it was an important article of export, but has of late years greatly fallen off; and at the present time only about 400,000 pounds are produced, scarcely more than is required for interior consumption. The government are encouraging farmers to turn their attention to this branch of culture, and some new plantations have been made. The seeds have been distributed in considerable quantities in various parts of the south, the sowing has shown good results, and it is expected that the cultivation of this valuable plant will be much increased. It takes about six years from the time the seed is sown before a crop is produced; but after that period each shrub will yield one pound three times a year, and last for a hundred years. There is little cost in cultivating or gathering, and no machinery is required; so that, though there is some time to wait before new plantations give any return, the ultimate profit is considerable. A slightly earlier result may be obtained by surrounding the plantation with lime or orange trees, well preparing the land, and shading the plants with suitable trees.

A quantity of coca-seed (*Erythroxylon coca*) was last year imported from Peru for distribution among the people in a suitable zone for its growth; but the result was unsatisfactory, from the bad quality of the seed, and fresh means are being taken to extend the cultivation of this plant.

Pepper and cinnamon are grown in the department of Alta Verapaz. Good seed has been imported from Ceylon, and planting is extending in that fertile district, while satisfactory results have been obtained in the department of Escuintla, where a few plantations have been made.

Rice is a very large article of consumption in the republic, and the government have established at San José works for perfecting machinery to separate the husk.

Good tobacco is grown, but little attention is paid to the mode of preparing it. The production is being encouraged by the gratuitous circulation of the best seed procurable from Havana, the United States, and Sumatra, and many new plantations are being made.

In spite of endeavors made to protect the rubber or caoutchouc trees, the production of rubber continues to decrease, and only in Verapaz and Peten are trees found in any quantity; while the growers show no signs of replacing those that are worn out. Holes are made in the stems to extract the sap, and alum, saltwort, or some other juice, used to coagulate it. It might be made a profitable industry if proper knowledge and appliances were brought to bear. A few new plantations are being made in one or two low-lying farms; about 3,000 quintals are annually exported. The plant yielding Guatemala rubber is *Castilloa elastica*.

Among other products grown are maize, beans, peas, and potatoes in sufficient quantity for home consumption; sarsaparilla and vanilla grow wild on the mountains all over the country. The price of sarsaparilla has fallen greatly. There was scarcely any exported last year, and in 1887 it only reached the value of $8,105. The quality of the vanilla is good, but, though it figures as an export, it is not cultivated for that purpose.

Banana-planting in the east is occupying much attention as a profitable industry, some 200,000 trees being now yearly planted for the supply of the United States market. About 120,000 bunches are at present exported annually. Peruvian (*Bœhmeria nivea*) was also introduced three years ago, and more than 600,000 shoots were distributed with a view to its general cultivation, but exportation of the fibre has not met with satisfactory results. Indigo-works are subsiding in the country, though a few still exist in the east, and means are being taken to encourage them. Indigo was exported to the value only of $465 in 1888, though formerly a very large trade was done in it. The industry in cochineal has almost entirely disappeared: for thirty years it was the principal article of export, and now the little produced is used for native consumption, aniline dyes having ruined the trade.