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# THE LAKE REGION OF CENTRAL AFRICA: A CONTRIBUTION TO THE HISTORY OF AFRICAN CARTOGRAPHY.

By E. G. RAVENSTEIN.

(Read at a Meeting of the Society, Glasgow, 21st November 1890.)

(With Maps.)<sup>1</sup>

A SHORT time ago I received a letter from a friend in Liverpool, who had seen an old globe in a Swedish museum, which, to his utter astonishment, depicted Central Africa as a region abounding in lakes. As this globe dated back to the seventeenth century, my friend, not being a professed geographer, quite naturally accepted the presence of these lakes as proof of actual discovery, and concluded that our modern explorers could therefore be credited at most with having re-discovered lakes, known long since, but erased from modern maps by a younger generation of cartographers infected with the sceptical spirit of their age and generation.

When your Society honoured me with an invitation to lecture before you, I thought that this subject might prove more especially attractive to a Glasgow audience, for your city is not only closely connected with Livingstone, who has done great things towards an elucidation of the hydrographical features of Central Africa; it is also the headquarters of an African Lakes Company, which promises so much towards throwing open the Dark Continent to commerce and civilisation.

I am quite aware that my subject is not a new one. Fully two centuries ago the learned Ludolphus, in his work on *Ethiopia* (1681), pointed out the errors of his predecessors, who, not content with retaining Ptolemy's two Nile lakes, had assigned to the great lake of Abyssinia a position which gave quite a distorted view of what was really known in their day. The contemporaries of Ludolphus took little heed of his criticisms, and it was only with Delisle and D'Anville that these gross blunders of an uncritical age disappeared from our maps.

**BEFORE PTOLEMY.**—Before proceeding to a consideration of Ptolemy's map, it may be worth while to indicate broadly the materials which were available when that great cartographer compiled his monumental work. In early times the communication between Egypt and Meroe, the great metropolis of Ethiopia, were frequent. Quite a host of travellers are known to have visited the city which was then the centre of a powerful empire. Philo furnished Eratosthenes with the latitude of Meroe; Dalion is reported to have travelled far beyond that city; Simonides, the younger, stayed five years there, and wrote a work on Ethiopia; Bion lived some time there; whilst two centurions, sent out by the Emperor Nero in quest of the sources of the Nile, are reported to have reached

<sup>1</sup> The maps accompanying this paper are reduced from some of the diagrams exhibited at the meeting.

extensive swamps, overgrown with rushes, which effectually put a stop to their further explorations. The coast of Eastern Africa was known as far south as Rhapta, an important emporium exporting ivory, rhinoceros horns, and tortoise-shell.

Unfortunately, with the exception of a "Periplus" of the Erythræan Sea, usually ascribed to Arrian, the reports of these travellers and explorers have only reached us in a fragmentary shape. Neither Strabo nor Pliny, to whom we are indebted for nearly all these fragments, have succeeded in reconciling the various authorities whom they were able to consult. The main facts, so far as they bear upon our subject, appear to be as follows :—

The Nile, below Meroe, or rather below its confluence with the Atbara, was known as Siris. Our Atbara was represented by the Astaboras, said to have its source in a lake, and asserted, by Artemidoros, to bifurcate, and to send one of its arms into the Red Sea. This supposed eastern arm of the Astaboras is undoubtedly the modern Wadi Baraka, which has, however, no connection whatever with the Atbara. The Blue Nile was known anciently as Astasobas, or Astosapes, that is, the river of Soba, or Sape, a town identical with Ptolemy's *Esar*, the ruins of which still exist above Khartum. The Astapus, lastly, was the river which flowed along the western side of Meroe; and when Strabo tells us that this river was called by some "Astasobas," he only gives expression to popular opinion, in accordance with which the "Blue Nile" was looked upon from the earliest times as the true head-stream of the Nile, the floods of which, produced by heavy rains in the mountains of Ethiopia, were the cause of Egypt's fertility. As to the White Nile, it must have been known, for we can scarcely doubt that it was this river which was explored by Nero's centurions; but its native name has not been placed on record, unless we suppose it to have been "Astapus." All these rivers are in a vague way supposed to have their sources in lakes, but the only lake mentioned by name is Strabo's *Psebo*, "above Meroe," which is usually identified with Lake Tsana, but may equally well be some other Abyssinian lake, such as Lake Haik.

Very little was known of the country just mentioned. In the time of the "Periplus" (100 A.D.) Greek merchants were in the habit of going from Adulis to a place called Koloe, an ivory mart, three days in the Interior, whence it was a five days' journey to the capital of the Auxumitæ, our modern Axum. Koloe is represented by the modern village of Halai, at the edge of the plateau, and is referred to as Kole in ancient Ethiopian documents. Beyond Axum these adventurers crossed a river "Nile," in this instance clearly the upper Takazze, or Atbara, into a district called Cyeneum, which abounded in ivory. The mountains forming the eastern edge of Abyssinia are referred to by Agatharchides (116 B.C.) as the Pseboean mountains, a name recalling Strabo's *Lake Psebo*. The name of many tribes are mentioned. Of these I only need refer here to the Simbarri and Paluogges, because, owing to a similarity of name, they have been placed on the Upper Nile—quite erroneously, as I conceive—as a careful perusal of Pliny's work shows distinctly that they were supposed to dwell between the Blue Nile and the Abyssinian

mountains. As to the "Pygmies," first mentioned by Aristotle, and placed by Pliny, that indiscriminate compiler, in the "marshes in which the Nile rises," they were not believed in by Strabo, and have found no place upon Ptolemy's map.

The coast outside the Red Sea, as far as Rhapta, is described with considerable detail in the anonymous *Periplus of the Erythræan Sea*, already referred to. Its author, unfortunately, says nothing about the interior of the country. It is clear, however, that the ivory-hunters established on the Afer and Somal coasts proceeded some distance inland, for Artemidoros of Ephesus (100 B.C.) mentions a "salt sea" and a fresh-water lake inhabited by crocodiles and hippopotami, together with a river Isis, as existing in the Myrrh country, and tells us, moreover, that a river Nile rose farther to the east. It scarcely admits of doubt that the salt lake in question is identical with Lake Assal, at the back of the bay of Tajura; that the fresh-water lake still exists in Ausa; that the Isis is now known as Hawash, whilst the "Nile" is the upper Leopard River, which loses itself in a marsh, or lake, near the East Coast, not far from the mouth of the river Jub. Marinus of Tyre, the immediate predecessor of Ptolemy, confirms the existence of lakes near the East Coast of Africa, and one of these lakes he looked upon as the head of the Nile of Egypt. The maps and writings of Marinus have unfortunately been lost. All we know about them is derived from Ptolemy, who only refers to them for the purpose of subjecting them to a scathing criticism. The views of Marinus, however, appear to have influenced later writers, and more especially the Arabs.

PTOLEMY.—From what I have stated, it must be perfectly clear to you that the ancients, up to the days of Ptolemy, were absolutely ignorant of the fact that the main branch of the Nile rises in a vast lake lying under the Equator. The lakes vaguely referred to by them were evidently the lakes of Abyssinia or of the Maritime region of Eastern Africa. Ptolemy, however, with that uncompromising definitiveness almost inseparately connected with the mapping of geographical facts or hypotheses, derives the famous rivers from snow-clad mountains, and from two lakes which he places far to the south of the Equator.

When the existence of snow mountains and vast lakes in Equatorial East Africa first became known to us about half a century ago through inquiries instituted among the leaders of caravans who had visited the Interior, and when soon afterwards these mountains and lakes were actually found by European explorers to exist, geographers somewhat rashly saw in this a remarkable confirmation of Ptolemy's hypotheses. Dr. Beke, as early as 1846, looked for the "Mountains of the Moon" in Unyamwezi. Subsequently (1848) he assumed that they formed the eastern edge of the African plateau, and that the Nile had its sources on their inward slopes, a hypothesis on the strength of which he considered himself entitled to be looked upon as the "theoretical discoverer of the sources of the Nile." A few years afterwards (1861) he identified the Victoria Nyanza and the Tanganyika with Ptolemy's two Nile lakes. Sir R. Burton (1864) sought these Nile lakes in the Tanganyika, of which he himself was the discoverer, and in the Baringo, and he associated the

snow-clad Kilma-njaro with the Mountains of the Moon. After Baker's discovery of the Albert Nyanza, M. Berlioux (1874) identified that lake and the Victoria with Ptolemy's lakes, whilst Kenia and Kilima-njaro still represented the Mountains of the Moon. Still more recently, after the discovery of the snow-clad Ruwenzori, and the exploration of the Albert Edward, Mr. Stanley transferred Ptolemy's Lunar Mountains to that remote part of Africa, and this rather startling hypothesis has not been wanting supporters.

Almost the only modern critic who doubted Ptolemy's knowledge of Equatorial Africa has been Mr. W. D. Cooley (*Ptolemy and the Nile*, 1854). Mr. Cooley identifies the Astaboras with the Mareb, the Astapus with the Atbara, Strabo's Lake Psebo with Lake Tsana, and Ptolemy's Nile lakes with the marshes in which the Leopard or Haines River loses itself. Ptolemy, according to Mr. Cooley, knew nothing of the White Nile, whilst the sentence referring to the Mountains of the Moon "does not belong to the genuine text of his work."

After a careful study of the subject, I have arrived at conclusions identical, in several respects, with those put forward by Mr. Cooley. We cannot examine Ptolemy's map of the part in Africa here in question without perceiving that much information, which we know to have existed, and which must have been available at Alexandria, has not been utilised. Ptolemy does not appear to have consulted the anonymous *Periplus of the Erythraean* (witness his misplacements of Coloe and Menuthias); he knew nothing about the expedition which Nero sent to Meroe and the Upper Nile; nay, he cannot even have read such standard authors as Strabo and Pliny. On the other hand, his map embodies information not given by his predecessors, and most likely derived from the work of Marinus of Tyre; nor must we lose sight of the erroneous graduation adopted by the Alexandrian geographer, who assumed a degree of the Equator to measure 500 stades (or fifty geographical miles) instead of 600 stades. Wilberg and Cooley have sought to eliminate the errors arising from this mistake by overlaying Ptolemy's map with a corrected network of parallels and meridians. This proceeding, however, would have been admissible only if the whole of the map were based upon itinerary materials, not checked by occasional latitudes obtained by astronomical observations. Meroe, for instance, the latitude of which had been observed, occupies approximately its true position, whilst Adulis, which is dependent upon a dead-reckoning carried southward from Alexandria, is placed  $3^{\circ} 34'$  too far to the south. An amended graduation would give to the latter very nearly its true place upon the map, but it would shift Meroe more than two degrees to the northward, and correct in no wise the latitudinal difference between the two places, which would still amount to  $4^{\circ} 45'$ , whilst in reality it does not reach  $1^{\circ} 45'$ . I have, therefore, discarded an amended graduation, but furnished Ptolemy's map with an amended scale instead, which enables us to measure the direct distances between places shown upon the map, quite irrespective of the degree-lines which cross it.

After these preliminary observations, I proceed to a more detailed examination of Ptolemy's map, and begin with Meroe, in order to identify,

as far as possible, the rivers and localities which have found a place upon it, and to ascertain whether there exists any connection between them and the Upper Nile as now known to us. The Astaboras, which joins the main Nile below Meroe, I do not hesitate to identify with our modern Atbara. The unnamed tributary of that river, which is shown on Ptolemy's map, but is not referred to in the text, may possibly be the Mareb, along the banks of which dwelt the Molibae. The Astapus is almost unanimously identified with the Blue Nile, and Lake Coloe, from which it issues, with Lake Tsana.<sup>1</sup> Such an identification, however, presents very considerable difficulties. The island of Meroe, according to Ptolemy, included also the country of the Sebridæ or Sembritæ, whose capital was Eser or Sape (Bion ap. Pliny, c. 35). The position of Sape has been satisfactorily ascertained, and the country of the Sembritæ extended undoubtedly along the Blue Nile. As Ptolemy's "Astapus" enters the main Nile above Eser, we are bound to identify the latter, that is, the main Nile, with the modern Blue Nile, whilst the Astapus would be the Rahad or the Dender, which flow into that river from the Abyssinian highlands. Other features of Ptolemy's map favour the same hypothesis. The Ptomphanae, who, according to Pliny, had a dog for their king, must be looked for in Fazogl, where Brun-Rollet and Marno found customs surviving which explain the name given to this tribe by the ancients. The "Catadupi," or cataracts, which Ptolemy places on his main Nile, may possibly refer to the falls which the Abai forms after leaving Lake Tsana. As a matter of fact, all is confusion in this part of his map. Nor do we fare better if we approach Ptolemy's Astapus from the Red Sea. Three days from Adulis, so the *Periplus* tells us, we reach Coloe,—a name found on Ptolemy's map in quite a different position. Five days beyond Coloe we reach Axum, and still farther west we cross the "Nile,"—that is, the Astapus of Ptolemy's map, or our modern Takazze. Mr. Cooley, it will thus be seen, was justified in identifying the Astapus with the Atbara, for the Takazze is the Upper Atbara, and I quite agree with him when he identifies Ptolemy's Pylæi Montes, which lie beyond that river, with the snow-clad mountains of Semen. But if the Astapus is not the Blue Nile, Lake Coloe cannot possibly represent Lake Tsana, from which that river rises. Fortunately Ptolemy himself enables us to give that lake a more correct position than that assigned to it upon his map. He places Lake Coloe to the south of Gabartus Mons, and in the Myrrh country. Gabartus is readily identified with the Jabarta of the Arab geographers, said to extend from Zeila to Shoa. If Gabartus Mons be anywhere in Ifat, its position on Ptolemy's map is surprisingly correct, for he places it at a distance of 250 miles from Aualites (Zeila), the real distance being 225 miles. The lake is placed *south* of Gabartus Mons, and may possibly be the Zuway, which has, however, no connection whatever with the Nile. If we place the Coloe in the Myrrh region, which ancient authors unanimously describe as being situated around the head of the Gulf of Aden, it may be identical with one of the lakes at the back of Tajura Bay, in which case the river connected with it would be the

<sup>1</sup> De Barros, *Asia*, 1552, first identified Lake Coloe with the Barcena or Lake Tsana.

Hawash ! Our result then is as follows :—Ptolemy's Astapus is the Upper Astaboras (Atbara)—that is, the Takazze—and is supposed to send an arm into the main Nile south of the country of the Sembritae, whilst communicating at the same time with Lake Zuway, or perhaps with the river Hawash. The confusion could not be greater. Any notion that Ptolemy heard of the existence of his "Nile Lakes" from Meroe must be abandoned.

Such knowledge, if ever he possessed it, can only have been obtained on the East Coast, and that only from caravans which traded between Rhapta, the great emporium of Azania, and the Interior. Rhapta, which derives its name from the sewed boats employed all along the coast of Eastern Africa, as also in the Red Sea, has been identified by various authorities with quite a number of places. De Barros (1552) and Dr. Vincent placed it at Kilwa ; D'Anville and Dr. Beke at the mouth of the Lufji ; Dr. Berlioux (1870) at that of the Pangani ; and Mr. Cooley (1854) at that of the Jub. Most authorities, however, agree that it should be looked for somewhere in the bay facing Zanzibar Island.

This view certainly derives confirmation from the statements made in the *Periplus*, as also from an inspection of Ptolemy's very imperfect map. As an instance of these imperfections, I may mention that Ptolemy tells us (I. 17) that Rhapta was on a river not far from the sea, and close to a promontory bearing the same name ; whilst, on his map, Rhaptum promontory is situated a hundred miles to the south-east of the river, and the town stands 75 miles above its mouth. Loose or contradictory statements, such as these, unfortunately disfigure much of what Ptolemy tells us about the East Coast of Africa. I believe, however, that Bagamoyo or the village at the mouth of the Kingani may fairly be assumed to occupy the site of ancient Rhapta.

In adjusting the information given in the *Periplus* and by Ptolemy to a modern map, it is of importance that the positions of Aromata promontory and Zingis peninsula or Opone should be ascertained. As to the former, it is beyond a doubt our modern Cape Guardafui, although Ptolemy places it in lat. 6° N. on his map, and in 4° 15', or 5° 41' N. in his text (Books I. and VIII.) ; whilst its correct lat. is 11° 50'. It is equally certain that Zingis peninsula is represented by our modern Ras Hafun, whilst the village of that name represents Opone. The distance between Opone (Ras Hafun) and Bagamoyo, following the sinuosities of the coast and touching at Pemba, amounts to 1255 geographical miles. A voyage from Opone to Rhapta (Bagamoyo) occupied, according to the *Periplus*, 25 days, or rather "courses," a day's and a night's sail being reckoned as two "courses." A day's sail would thus have amounted to about 500 stades or 50 miles. This is a reasonable distance. Ptolemy, when discussing the distances given by Marinus, admits that 400 or 500 stades daily would be a fair average ; whilst Dr. Krapf, who travelled in 1843-4 from Cape Guardafui to Zanzibar in native craft, spent 24 "courses" upon his voyage, his daily progress having varied between 25 and 66 miles, and averaged 55 miles. Theophilus, one of the mariners cited by Ptolemy, performed the voyage from Rhapta to Aromata in 20 days ; whilst Diogenes, sailing in the opposite direction, did so in 25.



It is therefore with a considerable degree of confidence that we place the Apocopa Magna of the Periplus at Hopia, and Sarapion at Merka, whilst identifying the Pyralai islands, Menuthias, and Rhapta, respectively, with Manda, Pemba, and Bagamoyo.<sup>1</sup>

Ptolemy's map and text present far greater difficulties. According to the details given by him (i. 17), a voyage from Opone, or the Zingis promontory, to Rhapta occupied 24 "courses"; and as the development of his coast-line only amounts to 756 miles, each "course" would average only 30 miles. This distance, measured off on a modern map, would carry us no farther than the Wubushi or Durnford River, to the south of the Jub; and this induced Mr. Cooley (*Ptolemy and the Nile*, 1854) to assume the existence of two Rhaptas, that of Ptolemy on the river Jub, and that of the *Periplus* at Kilwa. It seems unlikely, however, that the Greeks should have bestowed the same name upon two ports lying on the same coast; and I am content to leave Rhapta somewhere on the coast facing Zanzibar Island, where nearly all authorities place it.

And now I come to the Nile lakes and the Mountains of the Moon. If Rhapta is now represented by Bagamoyo, these lakes and mountains should have been discovered in the positions assigned to them upon the map I place before you. Lakes have been discovered, but not in the absolute or relative positions which the Nile lakes occupy on Ptolemy's map; whilst as to a range of snow-clad Lunar Mountains, stretching for nine degrees from east to west, it would be difficult to discover anything corresponding to them upon a modern map of Africa.

Fortunately, Ptolemy himself discloses to us the slender authority upon which his delineation of these lakes is founded (i. 9, 17). It is evident that he found depicted upon the map of Marinus a number of lakes lying near the coast, such, for instance, as are referred to by Artemidoros, who even mentions a river "Nile" as rising in northern Somal Land, which later geographers connected with the Nile of Egypt. Diogenes is reported by Marinus to have been abreast of these lakes when a little to the north of the promontory of Rhapta. No details of the voyage of Diogenes are given, except that it lasted 25 days, and the lakes referred to by him may have been farther north—for instance, near the Jub—where the Leopard River actually loses itself in a lake not far from the coast.

To a man of Ptolemy's intelligence, the idea that a river like the Nile, traversing half a continent, should rise in a coast lake on the Indian Ocean, was utterly repugnant; and it must have been with much satisfaction that he learnt from traders of Muza that these lakes were not on the coast itself, but "much farther inland." But how much farther—350 miles, or only a few days' journey? Most likely the latter. Ptolemy's map affords no indication at all that its author had itineraries connecting these lakes with the coast, nor does he hint at any itinerary in his text. He associates, however, the "cinnamon region" with his lakes; and as this region extended eastward to Aromata and Zingis, we may fairly assume that on the map of Marinus the lakes occupied a position

<sup>1</sup> For a discussion of this question, see Dr. Müller's editions of Ptolemy and the Minor Greek Geographers.

somewhere in the northern Somal country. It is there Ptolemy found his "Nile Lakes"; but instead of leaving them where they had been correctly placed by his predecessor, contenting himself with severing all connection between them and the Nile, he chose to do otherwise. He retained the lakes as heads of the Nile, but swept them far into the Interior. The same process was applied by Ptolemy to the lake in the Myrrh country, which figures upon his map as "Coloe." The "Mastitae," who are stated to dwell between this Coloe and the Nile lakes, cannot therefore be the "Masai," as suggested by M. Berlioux, but are more likely a tribe which dwelt to the eastward of the Hawash. Perhaps our modern Harar occupies the site of their capital, Maste.

As to the "Mountains of the Moon," it may safely be asserted that, in the locality indicated by Ptolemy—that is, in the country at the back of the Anthropophagi—there are no mountains answering their description. The only snow-clad mountains of Africa known to the ancients were those of the Atlas and of Abyssinia (Semen), and only the latter can have fed the Nile. To expect us to believe that the remote Ruwenzori was one of them is really asking too much. Mr. Cooley, who has devoted considerable attention to this subject, suggests that the whole passage referring to these mountains is an interpolation of later date, and forms no part of the genuine text of Ptolemy. This, however, is probably going too far: for, although many of the immediate followers of Ptolemy are silent with regard to these mountains, and even advance hypotheses of the origin of the Nile quite inconsistent with their existence, there remains the fact that Philostorgius (died, 430) speaks of a country in Eastern Africa named after the moon; that a "geographical fragment" of the fifth century, or of a later date, describes them; that nearly all the Arab geographers have something to say about a *Jebel el Komr*, or *el Kamar* (Green or Lunar Mountains), feeding the head-streams of the Nile; and lastly, that there actually does exist a country in Eastern Africa named "Land of the Moon," or *Unyamwezi*. This vast region is now split up into numerous rich communities, but may well have formed a powerful empire in a former age, whose name and reputation were carried by caravans down to the coast, just as in a subsequent age "*Monemugi*" became known to the Portuguese, without their learning anything about the vast lakes that lay beyond it. Indeed, *Unyamwezi* may have extended at one time to the very coast itself.

**PTOLEMY'S SUCCESSORS.**—The centuries following Ptolemy's great achievement added next to nothing to our knowledge of the sources of the Nile. Orosius (410) and his follower, the Istrian *Æthicus*, know nothing of Ptolemy's lakes, but connect the great African river with the Nile of Artemidoros, in Somal Land, and make it pass through a large lake, on issuing from which it is described as forming cataracts, and then flows on to Meroe. This is clearly a resuscitation of the ideas of *Marinus*. The "great lake" may possibly be identical with Lake *Tsana* in Abyssinia.

Of quite a different character is the information of a "Geographical Fragment" of the fifth or a later century, which has been published in

Hudson's *Minor Greek Geographers*. I have embodied its information in a small map, on examining which you will at once perceive that we have before us merely an amplified reproduction of Ptolemy's lakes, the unknown author having affixed names to various objects, some of them to all appearance of his own invention. The "Crocodile Lake" reminds us of the fresh-water lake referred to by Artemidoros, which is said to contain crocodiles; the "Lake of the Cataracts" may be meant for Lake Tsana, whilst the "Great River" to which these lakes give rise is represented as flowing through the country of the Champesidae—that is, Abyssinia—for Mr. W. D. Cooley points out that Khampesia is the modern Greek mode of writing Habesh.

THE ARABS.—This map, therefore, throws no fresh light upon the question of the Equatorial Lakes of Africa. Nor do we obtain more comfort by consulting the writings of the Arabs. Whatever the Arabs may have done in enlarging our knowledge of the Sahara and the Western Sudan, they have added little to what we knew previously about Abyssinia and the sources of the Nile; and if their knowledge of the eastern coast of Africa extended farther south than did Ptolemy's, their maps are very inferior to that of the Alexandrian geographer. They accepted, in fact, Ptolemy's Mountains of the Moon and the Nile Lakes, but placed a third lake at the junction of the two head-streams, from which they derived not only the true Nile but also the river of Ganah, or the Nile of the Sudan (*i.e.* Niger-Senegal), and the Nile of Magdashu, or Leopard River. This great source-lake is named "Kura," or Kawar, and is undoubtedly the Tsad. Shems-ed-Din (*c.* 1331) has these same lakes, only with more elaboration. His eastern Nile lake is clearly the Fitri, on whose shores dwell the Kuka; his western lake may be represented by the swamps of the Tuburi; his many parallel rivers seem to stand for the arms of the Shari; whilst the northern lake, said to be named Kuri by the Sudanese, is undoubtedly Lake Tsad, for a tribe named Kuri still dwells upon some of its islands. The Nile of Nubia flows out of this lake to the northward, the river of Ghana flows west, and that of Magidshu (Makhdeshu or Madisha) into the Eastern Ocean. Of course, if the great lake of the Arabs represents Lake Tsad, their Mountains of the Moon must be looked for to the south of Bornu, in Mandara. That some of the details mentioned by Arab writers in connection with these lakes may refer to Abyssinia and Lake Tsana, is not impossible.

MEDIAEVAL MAPS.—Our mediæval cartographers were content for a time to copy Ptolemy and the Arabs, but when the great enterprise of the circumnavigation of Africa, set on foot by Prince Henry, began to bear fruit, and closer connections had been established with Abyssinia, authentic information of what was then considered the country giving birth to the Nile was received in Europe. The oldest map which bears evidence of these acquisitions, and one of the most remarkable cartographical documents in existence, is that prepared by Fra Mauro, a learned monk of Murano (1457). His Abyssinia, as we are told in one of the

numerous legends inscribed upon the map, is based upon information received from priests of that country. It exhibits its features far more correctly than does any other map up to the time of Tellez, who was able to avail himself of the labours of the Portuguese missionaries. The copy of this famous map, which I place before you, clearly reveals this fact, but it also shows that Fra Mauro enormously exaggerated the distances. His map has neither degree-lines nor a scale, but, taking the length of the Mediterranean for a unit of length, it will be found that the central lake of Abassia (Abyssinia) lies as far north as  $2^{\circ}$  S., whilst all Southern Africa, almost to its farthest extremities in lat.  $33^{\circ}$  S., is filled up with features belonging to Abyssinia. On this map may be traced not only the Abai, rising in Lake Tsana, and its tributary the Tagaz (Takazze-Atbara), considered by Fra Mauro to be the main Nile, but also the Hawash (Auasi), Lake Zuua (Zuway), and the Upper Xibe (Gibbe), or river of the Gallas, which is made to debouch in the Indian Ocean, as on nearly all but our most recent maps. The principal places along the eastern coast of Africa, as far as Sofala, can be identified. Fra Mauro, at all events in this part of the map, has quite abandoned Ptolemaic hypotheses, but he identifies Abassia with Ptolemy's Agysimba, and places in its centre the "Giebelchamir" (Jebel Kamar), or Mountains of the Moon, just as W. D. Cooley did four hundred years afterwards. Had Fra Mauro's materials been properly utilised, our old maps of Africa would have shown, long before Ludolphus drew attention to that fact in 1687, that next to nothing was known about the Interior.

Unfortunately, Fra Mauro's successors had so high a respect for the authority of Ptolemy that they felt restrained to retain his Nile lakes upon their maps, and to combine them with information obtained through Abyssinian sources. Martin Behaim's globe (1492) is an instance of the kind, for upon it features clearly belonging to Abyssinia, though apparently not derived from Fra Mauro's map, are made to occupy nearly the whole of South Africa. His large lake, in latitude  $10^{\circ}$  S., in the very centre of Africa, is clearly an expanded and embellished version of one of Ptolemy's Nile lakes, for the Mountains of the Moon lie to the south of it. But having crossed these mountains, we still find ourselves in "Abasia," as is proved by such names as Gafat (a well-known district in Gojam), Gama (Jemma), and others. Behaim was content to drain his lakes through the Nile. To Juan de la Cosa (1500), a Spanish pilot, who had, however, at his command the information collected by Portuguese explorers and discovers, belongs the doubtful merit of having introduced a South African central lake, giving rise at the same time to the Nile, the Zaire, and to a river flowing to the north-east, evidently a modification of the notions entertained by the Arab geographers with reference to Lake Kura. Ruysch (1507), and Schöner on his globe preserved at Frankfurt (1521), retained all Ptolemy's lakes in their integrity, but they introduced an independent river, having no outlet into the ocean, and apparently represented by Fra Mauro's Auasi (Hawash). Hylacomilus, who is best known as having bestowed the name of America upon the New World, revised an old map of Africa for a new edition of Ptolemy in 1521, and placed upon it a huge lake in

the very centre of South Africa (in  $15^{\circ}$  S.). He calls this lake "Saphat," a name anciently given by pilgrims to Lake Tsana. The nomenclature of his map proves distinctly that this lake occupies the centre of Abyssinia. Bali, the southernmost province inserted upon it, is a district to the south-east of Shoa, still known by that name.<sup>1</sup> On the globe, which Gerhard Mercator made in 1541, the great central lake of Hylacomilus bears the name of Sachaf—a corruption, I should say, of Saphat, or Caphat (Cafates)—and is joined by a river flowing to the Indian Ocean, to the south of Zephala (Sofala). Subsequent compilers of maps retained this lake; but they connected it, at their good pleasure, with the Nile, the Zaire, or any other river reaching the coast, until, at length, on such maps as those of Lazaro Luiz (1563) and Ortelius (1570), we find it sending forth emissaries in all directions.

A map of quite a different type is that by Giacomo Gastaldo, a Piedmontese (1548), who consulted De Barros, apparently, with little profit. He retains Ptolemy's lakes, as also the "Mountains of the Moon," but adds thereto several others, all of which, as can be gathered from the nomenclature, ought to be removed far to the north, into Abyssinia. The southernmost countries mentioned by him are Adia (Hadia) and Damot, well-known provinces of Abyssinia; and these he places in latitudes  $20^{\circ}$  and  $25^{\circ}$  S. on a river called "Rio de Linfante," which is the Great Fish River!

The last map which I shall refer to is that which accompanies Lopez's famous work on Congo, edited by Pigafetta (1591). This map has received much indiscriminate praise, but, as far as the interior of Africa is concerned, it is, in truth, a most extraordinary hotch-potch of ill-digested information derived from Ptolemy, the Arabs, and later writers and map-makers. A great Central Lake is situated between latitudes  $10^{\circ}$  and  $14^{\circ}$  S., and sends forth the Cuama (Zambezi), and the Manhice (which enters Delagoa Bay). The names "Minas do Cafates" (Gafat), Bagamidrij (Begameder), and Tacuy (a misprint in De Barros for Tacaz or Takaze), which are written near it, show that we are in Abyssinia. A huge river flows northward from this lake into an Equatorial "Lagoa do Nilo," from which issue the Zaire and the Nile. The people living near this lake are said to have stone houses like the Portuguese. Near this lake are Amara (Amhara), Ambian (Dembea), and Chedalasta (Lasta), and it is, therefore, clearly meant for Lake Tsana. From this lake the Nile flows to the island of Meroe, before reaching which it is joined by a river issuing from Lake Colue (Ptolemy's Coloe), to the west of which are placed the Fungi (that is, the Funj, who dwell to the west of the Blue Nile) and Beleganze, a compound made up of "Bali" and "Ganz," the names of two districts of Shoa. The river Golues, which issues from this lake, receives the Tacasj (Takaze) as a tributary. Again, to the north-east of this lake there is depicted a Lake Barcena, which is the veritable Tsana. Two rivers issue from it, one reaching the sea at Zeila, another joining the Nile at Meroe. The confusion in the

<sup>1</sup> M. Wauters (*L'Afrique Centrale en 1522*) published a facsimile of this map. The legend, which he failed to decipher, should be read: "Hic est magna copia auri." This is said of Damut, also a province of Abyssinia.

delineation of the hydrographical features of Africa could hardly be greater. How inferior are all these maps to the intelligible and, in its main features, correct representation of worthy Fra Mauro!

The early reports of the Portuguese explorers, and the writings of "geographers" of the period, though abounding in allusions to Equatorial lakes, tell us really nothing about them. The knowledge of Abyssinia, and of its lakes, was very extensive at quite an early period, as evidenced by Fra Mauro's map; and it only needed a master-hand to sift and reduce these ample materials to reasonable proportions in order to produce a fairly accurate map. Of the existence of our modern Lake Nyasa, the Portuguese may be presumed to have had an inkling at an early date; and it became first definitely known to them in 1616, when Gaspar Bocarro, on going from Tete to Kilwa, passed for some distance along it. In the course of the eighteenth century the Portuguese became acquainted with Lake Bangweolo, and probably also with the Moero, although they had no idea of its great extent. The allusions of early writers to the great lakes supposed to exist in Equatorial Africa were provoked by the very misleading maps which enjoyed a very high authority at the time. The original references to such lakes are very few indeed. Encisco (1519) would have us believe that the people of Congo told him that their river, as well as the Nile, rose from a large lake in the "Mountains of the Moon." This, certainly, is making too great a demand upon our credulity. Manuel Pacheco (1536), who proposed to King John III. to explore the Congo River, is far more reasonable when he tells us that that river is reported to rise in "lakes," a very vague term in the mouths of Africans, and quite as applicable to Stanley Pool, or a broad river, as to a more extensive sheet of water. The only other reference to lakes, on the part of an actual explorer, which I have been able to discover, is made by Balthasar Rebello de Aragão (1600), who left Loanda with the intention of crossing to the Contracosta, but did not even get as far as the Kwango. He was told that there existed a large lake, in about latitude 16° S., from which rose several rivers. All I can say is, that this worthy Portuguese was misinformed, for no large lake is to be found in the direction pointed out to him. Possibly the swamps of Lovale, or a small lake like the Dilolo, were alluded to. Of the interior of Eastern Equatorial Africa next to nothing was known. Albuquerque (1506) heard that a river flowed at the back of Magadisho; Enciso (1519) mentions the Ethiopian "Mount Olympus," which can be no other than Kilima-njaro; and quite a number of writers allude to a powerful empire, Monemugi, supposed—quite erroneously as we know now—to have extended from Monomotapa, on the Zambezi, to Gurage, one of the southern provinces of Abyssinia, and possibly identical with the modern Unyamwezi.

Our great African lakes—the Tanganyika, Victoria, Albert, and Albert Edward, I feel convinced, only became known in the course of this present century, since caravans of Arabs and Swahili penetrated the Interior in search of slaves and ivory. The credit of having discovered them is due to these enterprising traders, but for their delineation upon our maps we are indebted to such men as Burton, Speke, and Grant, Livingstone, Baker, and Stanley.