

PIONEER WORK OF GERMAN CARTOGRAPHER MAX MOISEL IN CAMEROON: AN ASSESSMENT OF THE COLONIAL ERA MAPPING CONTRIBUTION

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ABSTRACT

Cameroon coastal area was almost unknown till the worldwide travels were undertaken in the 15th century. It experienced colonial rivalries which later turned to the advantage of the Germans. After signing the July 1884 Treaty with Duala chiefs, they entered the Hinterland and needed maps to understand the land and get access to its resources. Although cartographers' achievements survived beyond colonial period, it has however attracted very low attention in Cameroon. This paper unveils the sheltered presence and inputs of a prominent colonial cartographer Max Moisel. His pioneer mapping has always met multiple needs notwithstanding some weaknesses related to archaic tools and uneasy mapping environment. Those maps stand as a unique legacy of former major administrative acts and boundary settlements. But their worth remains relevant at the present era of Geomatics. Their quotations in the ICJ judgement on Cameroon-Nigeria border dispute confirmed its international scope and significance.

Key words; Cameroon coast, Germans, Colonial map, Geomatics

I. INTRODUCTION

A map is a geometrical and conventional representation of part or the whole of the earth surface on a plane and a reduced scale (F. Joly, 1976). Broadly speaking, maps commonly display and disseminate geographical information. Mapping is a long process that evolved through centuries. African territories annexed by the Germans at the end of 19th century have never been mapped. The hinterland of Kamerun protectorate was therefore unknown till the eve of the twentieth century. Map-making appeared to be urgent and so important that the Colonial Office of the German Empire created its Colonial Institute of Cartography (Deutsches Kolonial-Lexikon, 1920). Before the First World War, Max Moisel compiled and edited a 31 leaves topographic map of Kamerun (Deutsches Kolonialblatt, 1914). He is indelibly quoted as a pioneer author of maps and many other cartographic documents that conveyed chorographical and general information.

In spite of some major changes in mapping logistics and instruments and the renewal of former maps with sophisticated devices, colonial and especially Moisel's maps survived. These maps have shown proof of their usefulness today but very few people are aware of it. Using the document analysis method, this paper attempts an inventory and assessment of some colonial cartographic archives. It tries to bring out major cartographic achievements and their uses during and after german rule in Kamerun.

2. ANALYSIS AND ASSESSMENT OF GERMAN ACHIEVEMENT IN CARTOGRAPHY

2.1. Methodology

Data have been selected from the german fund at the National Archives (NAY) and the map index of the National Institute of Cartography (NIC) both in Yaounde, Cameroon. Data collection

focussed on maps, mapping notebooks and reports issued during German rule. Our study has been split into two as follows.

Map reading was mostly concerned with the author or draughtsman, the content, the scale and the material upon which each map was drawn or painted. These data were then recorded and processed on a computer with ARCVIEW, MAPINFO, ENVI and EXCEL. GIS software permitted to reproject Moisel maps and other cartographic documents in a new and unique geodesic system in order to compare them and to overlay one another. It enabled us to assess Moisel map accuracy through a case study over Manenguba area.

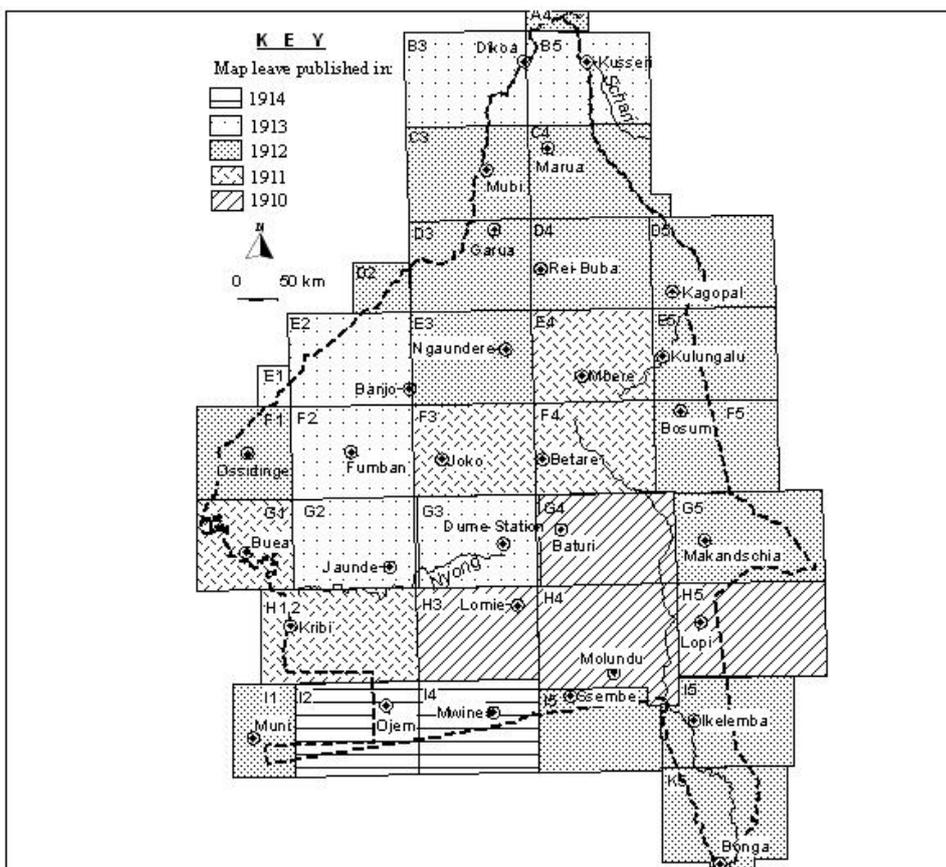
Mapping notebooks and reports were scrutinised to get keywords that provided information required in the preparation of colonial maps. Such keywords permitted additional research on Internet to complete the database.

2.2. Moisel's foremost place in the history of Cameroon cartography

Max Moisel is a colonial cartographer born on April 26, 1869 in Berlin, Germany. After he entered the Dietrich Reimer Institute 19 years later, he met and worked under H. Kiepert, the former director of the Weimar Institute and Richard Kiepert a historian geographer who devoted himself to cartography over African continent and the Near East. H. Kiepert died in 1899 and Moisel was appointed co-chair at Dietrich Reimer Cartography Institute. Under Moisel and Sprigade co-chairship, Dietrich Reimer Institute published maps of German colonies at the expense of the Colonial Office of German Empire and its Institute of cartography.

With the need of enough manpower for his duty in colonial time, Moisel stayed in Kamerun from 1907 to 1908 and organised exploratory journeys to gather data especially in unsurveyed areas. He trained military officers as well as colonial officials in mapping techniques and surveying. Therefore, some well skilled map authors are Moisel trainees. These authors include Achenbach, Ackermann, Barthel, Dürhing, von Dertzen, von Heigelen, Kilmesch, Kirshhof, Kund, Nitschmann, Reichelt, Schlieff, Strümpell, Zimmermann.

Moisel published maps at various scales for multiple purposes and demonstrated his concern and wish to apply cartography in almost all branches of scientific knowledge. The Map of Kamerun in 31 leaves and 3 detailed maps at a scale of 1:300000 is his major topographic work that was carried out for the Colonial Office of German Empire (Map 1).



Map 1: "Übersichtsblatt der Karte von Kamerun in 1:300.000"

In Climatology, he made a map of the pluviometric stations in Kamerun at 1:500000 and a 1:500000 map of pluviometric stations on Mount Kamerun. He published the Vegetation Map of the regions of Kamerun covered by the botanist Lederman. Moisel issued also a map of the Kamerun border between Yola and the Cross River cataracts at 1:2000000. Atlas of German colonies, with Yearbook and Great German colonial atlas at last were co-published by Sprigade and Moisel. Geographic features were also mapped: the Manengumba mountains at 1: 100000, the Northern Rim of the Kamerun plateau and Kamerun's Nordbahn's hinterland at 1: 200000. Moisel died in 1920.

2.3. Cartography during german rule in Kamerun

It has been mentioned that Kamerun hinterland was unmapped till the German flag was hoisted in Douala. Cartographer's effort and difficult task was to gather a variety of natural and social data for mapping purposes. According to mapping booklets and reports, data gathering included route surveys, astronomical observations, trigonometric surveys and Triangulation. (Seefried & al.; 1907, Ernst Vohsen(ed),1910). Data gathering and mapping process are among our main preoccupations. Mapmakers in colonial times did not benefit the photogrammetry science and its implementations. They watched geographical information on their route, plotting it on maps or sketches. Route in colonial context signified roads as well as hydrographical network. Colonial army officers and scientists headed route surveys and provided Moisel with "skizze" or maps anytime they went out for reconnaissance and military exploration. Besides route surveys, cartographers used data from monographies and surveys from neighbouring colonial possessions (Nigeria and French AEF1). Below is a table which presents original documents from which two maps were compiled (Table1).

Map	Route surveys	Monographie s	other surveys	astronomic and geodesic pitches
Mungo - Wuri	43	51	10	12
Fumban	181	47	13	16

Table1: Classification of original materials used to compile Fumban and Mungo - Wuri maps

From table 1 that data of various kinds and origin have been of great service to map compilers. It should be recall that route surveys as well as astronomical and geodesic survey of Kamerun did not originate from Moisel alone. Some studies started before his arrival in Kamerun. Dr Zintgraff's route survey from Barombi Lake to Ekobum dates back to 1888 and Dr Ersh geodesy study of the southeast area from 1897 to 1899. Mapping process was therefore based on compilation of existing materials and this is proven and illustrated below with consideration to publication date of the original materials listed in booklets accompanying the Fumban and Mungo-Wuri maps sheets (Chart 1). The graph shows clearly that the number of maps increased significantly from early 1880s when German settled in Kamerun. This flourishing mapping is directly attached to the colonial struggle and claims over African land.

¹ Afrique Equatoriale Française.

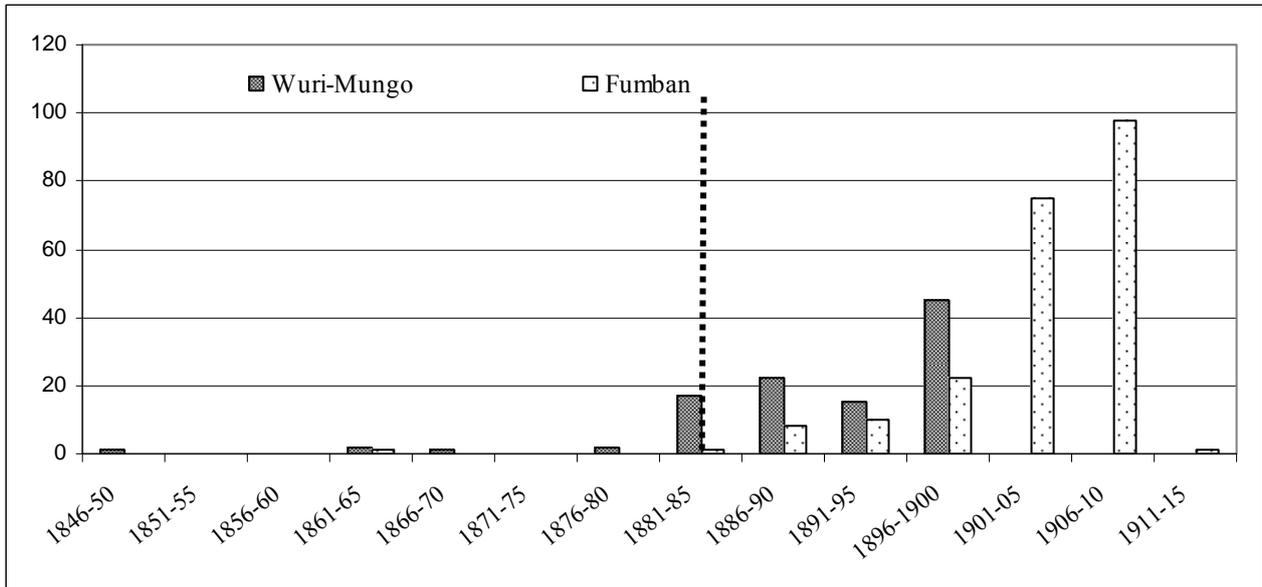
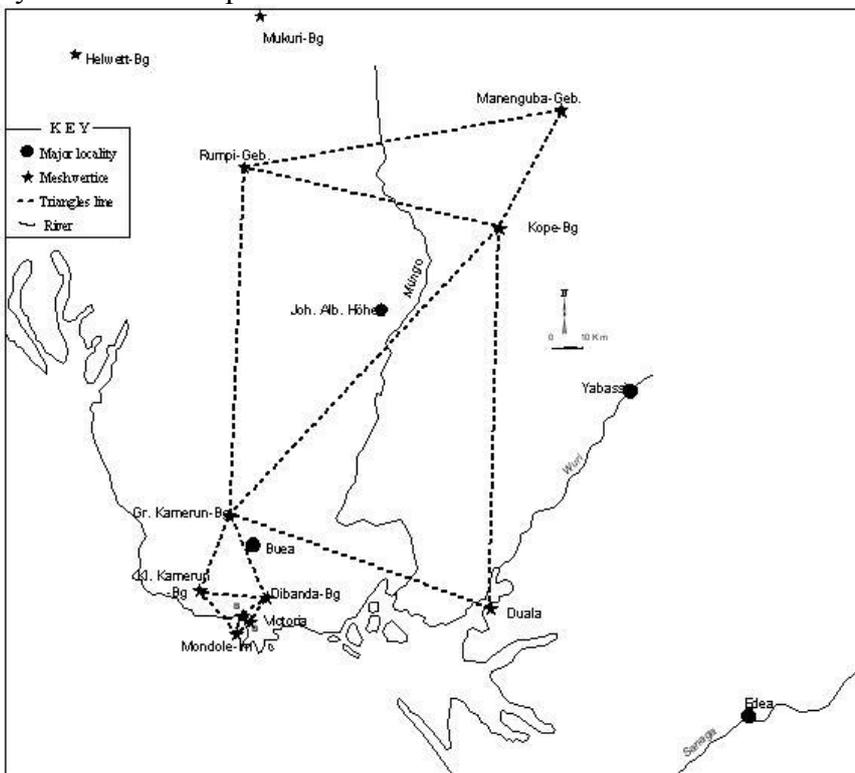


Chart 1: Temporal distribution of originals compiled for Wuri-Mungo and Fumban maps

Eye surveying may justly claim of having contributed to colonial Moisel maps, insisting on the fact that more precise tools and methods were needed to fill up and perfect route surveys database. After mapping notebooks, it can be said that the surveying devices consisted of Compass, Universal Instrument and Theodolite. The latter measures angles in horizontal plane and in elevation at points selected judiciously. In the triangulation process, colonial surveyors placed these points or mesh vertices on mountain ridges as on the chart below (map 2). This sample of triangulation process concerns the hilly south-west of Cameroon. As indicated earlier, surveyors put mesh vertices on Mount Cameroon at 4100m(Gr. Kamerun) and other summits that are more that 2000m high. These help a variety of natural and social objects connected with geographical distribution to be illustrated by means of a map.



Map 2: “Makette von Victoria nach Manenguba mit Basis(B-B) bei Victoria”

2.4. Typology of colonial maps

Colonial maps differ according to the scale, the underlying material, the author and the content or character of the information they convey.

These maps have various scales ranging from large scales (1:400) to smaller scales (1:5000000). Large scale maps ($\leq 1:25000$) were towns' plans which enabled cartographers to show most objects on a scale true to nature. Plans in German Kamerun were concerned with the structure of administrative and military posts, towns and cadastre where one can identify houses for example. Scale distribution for colonial maps database is shown in table 2 below which distinguishes four classes distribution of 111 colonial maps. Maps with scale not clearly displayed are not included. Smaller scale maps were dedicated to routes with military expeditions, landscape features, territorial divisions, protectorate boundaries and its hydrographical and communication networks. The medium category is topographic map which stand as the most complete as far as geographical data are concerned. The following exist also in the German fund: vegetation maps, ethnological maps, and travel maps, orographical and hydrological maps. The table also show maps with material upon which they were laid. Cartographers during German rule drew maps on two distinctive materials including cloth and paper. More maps were printed on 3 kinds of paper and very little on cloth.

Plans(<1:25000)	Medium scale (1:25000-1:100000)	Small scale (1:100000-1:500000)	Very small scale (>1:500000)
8	9	56	24
Cloth	Tracing paper	Ordinary paper	Transparent paper
10	8	78	8

Table 2: Scale distribution of colonial map database Sources

Either on cloth or on paper, these maps have been suffering from poor and inappropriate conservation. Alternate heat and humidity as well as careless users and personnel have damaged part of German map database. Then, one can guess that figures presented in table 2 may change with regards to the state and management of the German fund as whole and the map database attached.

Other cartographic documents include data reporting curves represented by a route connected by with geographical distribution like farming, rivers, meteorological data, landscape features, geological data and human settlements. An original document of 190cm x 66cm that summarized physical milieu, economy and demography of Kamerun was found in the German Fund, NAY. Moisel did not draw all these maps himself but he won fame as the compiler and first editor of the basic maps of Kamerun. Approximately 9/10th of smaller scale maps are extracted from Moisel basic maps.

2.5. Map editing

On colonial maps were plotted as many objects at appropriate and precise location. The draughtsman needed to be attentive to deal with many manuscripts for Moisel maps devices included dots, lines, pictograms...etc all with variations in format and colour.

Colonial maps show that cartographic presentation of lettering and symbols have been perpetuated. Colours used by cartographers for example on topographic maps were red, brown, blue and black to show different physical features with the black ink being dominant. Contours were used to distinguish mountainous and hilly districts from neighbouring lowlands. Lines indicated route surveys, roads, railway and hydrographic network which appear with names of surveyors and dates of undertakings. Dots were used to show scattered housing. Such devices are present on today's maps. But this is not a guarantee that Moisel maps were perfect.

Projection system and contour values were absent. Very few height figures are displayed and equidistance is always omitted. These make map reading quite difficult and do not allow slope computation. Delimitation of surface distributed objects like ethnic groups, vegetation types and

cultivated areas were not clearly materialised. Despite its weaknesses, Moisel maps are irreplaceable.

3. USE AND UTILITY OF CARTOGRAPHY UNDER COLONIAL PERIOD (1884-1960/61)

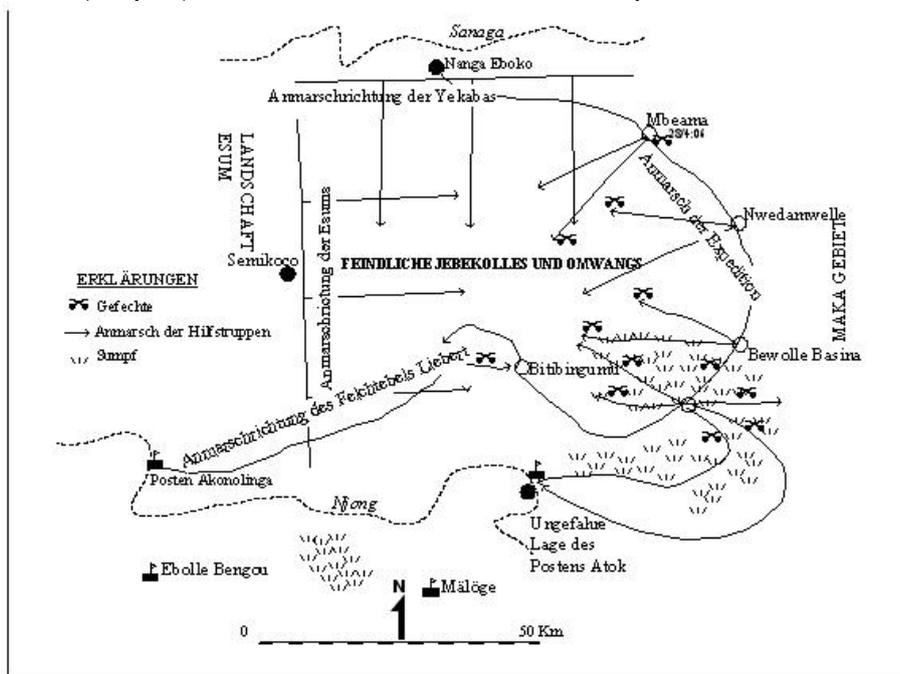
3.1. Colonial rivalries, international law and diplomacy

The use of maps is an old tradition in Europe and the Berlin Conference (November 15, 1884 to February 26, 1885) is an illustration of that tradition. It is at this Conference that the theory of Hinterland² and signature of treaties with the local chiefs triumphed as methods of acquiring colonies in Africa based on a map. Bismarck presented these principles using a wall map of Africa in the conference hall. The treaties were got either through negotiation or imposed, then illustrated as far as possible by relevant maps. Cartography became an indispensable activity for the entire colonial life and colonial powers the first and main consumers. Indeed Africans will discover the interests of such tool some decades later, some forty years after independence.

Maps were used in the settlement of the conflicts between European powers and Africans as well as between Europeans themselves, notably Germany, France and England. The East border of Kamerun shows a clear illustration of such conflicts settlement. After the ‘Coup d’Agadir’, German took only one year to issue 8 maps at 1:300000 scale over his new possessions. Agreements were usually accompanied with sketches or real maps. The relation between colonial powers was strained due to border disputes and the latter were solved thanks to cartography. Thus, the colonial powers therefore used cartographic art in their efforts to delimitate their respective land possessions. Land disputes related to private ownerships or administrative units were also solved by cartography.

3.2. Military use

A map is a military weapon that was used as tactical and strategic tool by the Germans. Landscape knowledge with its physical features, natural and human resources, was of a great worth and colonial wars made full use of cartographers’ expertise to guide the movement of troops as shown below (Map 3) in the sketch of the “Jebekolle” expedition.



Map 3 : Skizze zum Jebekolle Expeditions bericht vom 8. Juni 1906

² Bismarckian doctrine stipulating that each colonial power has the right to occupy the countryside land from the coast area towards interior till it meets another power. This was adopted as one of the major provisions of treaty signed at the end of that conference on February 1885.

This sketch is a current and strictly army document which troops and army officers used to plan and carry out successfully field expeditions. The same document in hands of instructors will help in teaching and training the troops for similar wars during the too long and harsh "pacification"³ (1884-1911). From this illustration, we guess our colonial masters required numerous maps both on land and sea.

Strategically, maps were needed for defence and security both internally and externally. The protectorate of the German denomination remained a crucial question. Major expeditions like Wute-Adamaua (1899/1901), Bangweh (1900/03), Nso (1906) mobilised all available expertise including that of cartographers. Despite their lack of experience in the overseas colonial enterprise, the Germans were well informed concerning the planning of territory thanks to cartographic knowledge. Civil and military, missionaries, traders and other social groups applied for maps and some colonisers were technically polyvalent or were trained in order to behave like cartographers.

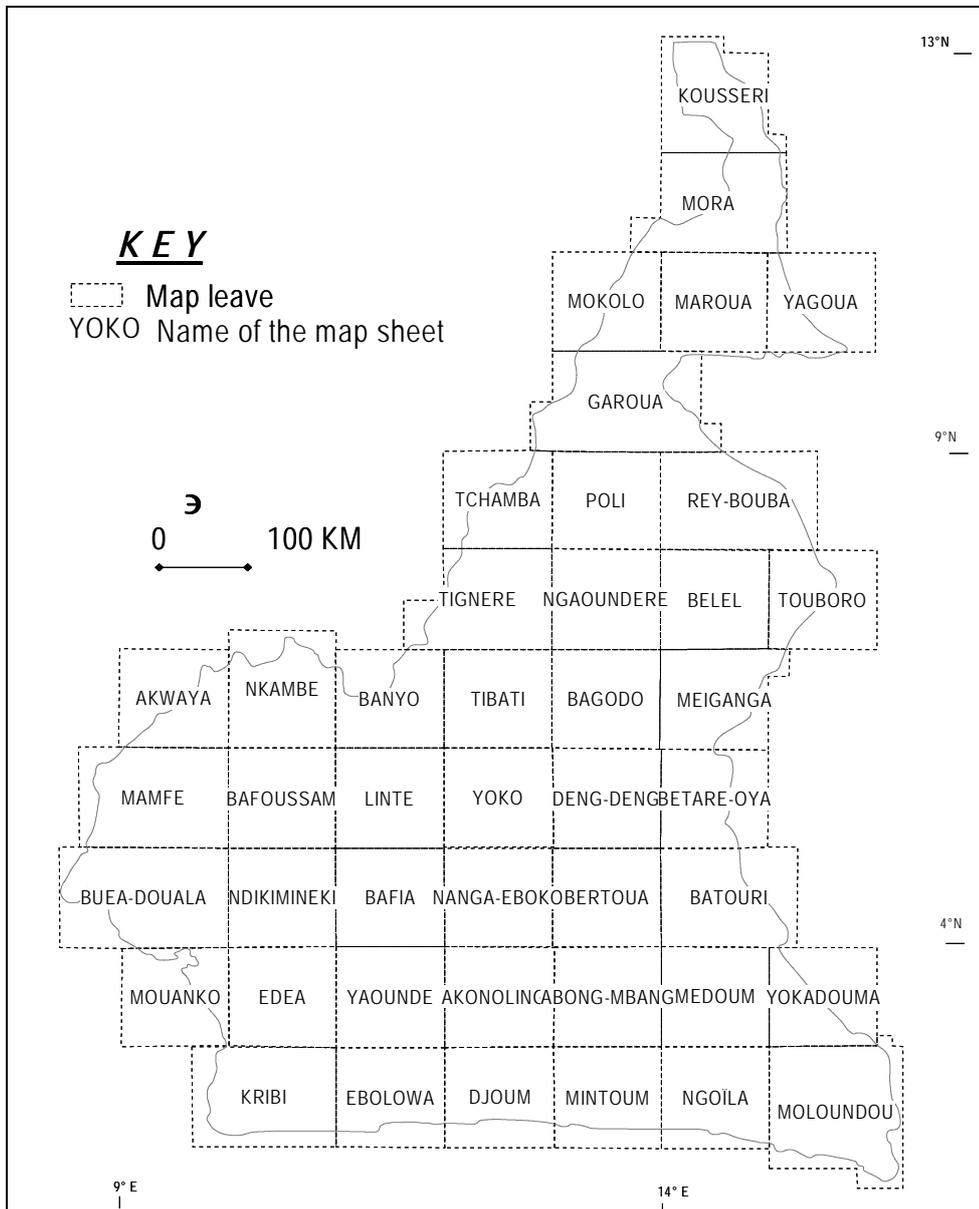
3.3. "Enhancement" of the territory

Enhancement means economical exploitation of colony by European masters. Economic organisation of Protectorate was preceded by the military annexation and the central and local administrations have been established in the same way. There was the need for means of transportation and communications by traders, missionaries, and soldiers. The Germans built roads, telegraph, bridges and railways, in response to their quest. It is in this light that Max Moisel and others carried out successful and colossal work despite the weaknesses. One cannot assess this achievement without bearing in mind the harsh conditions of the time. The utility of the cartography has been qualified indispensable.

With the capture German Kamerun by French and English since 1916, the new masters recognized and exploited the scientific and technical inheritance of Germans. The most appreciated aspects of Germans heritage is obviously cartography. Until their departure in 1960/61, the French and English used the Max Moisel and mates' maps as a strategy to own the country in all viewpoints. They also used these maps to settle disputes among indigenes. For example, the English used an old German map to settle the conflict between Foto and Fongo Tongo in 1918(Saha Zacharie, 1993).

Some Moisel manuscripts were plagiarised by French since they didn't carry the true names of authors. Interviews of some NIC staff and a look at Moisel manuscripts show that topographic map of Cameroon at 1:200000 had been drawn from and completed using former Moisel work. It is not necessary to insist on this hypocrisy of the Cameroon National Geographical Centre (NGC) and its allied, the French National Geographical Institute (NGI). Map 4 below shows the topographic map of post independent Cameroon produced by the NGC and NGI. In all viewpoints, modifications especially on scale did not make it very different from map 1. This proves again the quality and the utility of maps drawn by German talented cartographer Max Moisel.

³ Name given by German to the struggle against African armed resistance under colonial era. The military conquest of Cameroon lasts almost 30 years, from 1884 till late 1911.



Map 4: Topographic map of Cameroon after independence

After decolonisation, Cameroonian leaders who took over from colonial masters didn't perceive the immediate interests of this inheritance even though some internal and external boundary disputes incited them to recognise this evidence. In post independent Cameroon, cartography did not benefit the same consideration as in German Cameroon.

The Germans gave priority to cartography and the department charged to map colonies was directly attached to the crown through the Colonial Office of German Empire. It was therefore more funded as compare to departments that were under the governor control and his personnel.

4. FATE OF GERMAN CARTOGRAPHIC INHERITANCE AT POST-COLONIAL PERIOD (SINCE 1960/61)

4.1. Political and cultural re- appropriation

In the struggle for national identity, the Cameroonians felt the need of the inheritance of the german colonial cartography. During nation liberation, german maps were of great importance to militants and sympathisers of Union des Populations du Cameroun (UPC). The Neu Kamerun drawn before the First World War covered more than 900,000 square kilometres and Ruben Um Nyobè referred to the borders provided by this map as the legitimate borders of Cameroon. The post-colonial government reproduced even with imperfections the colonial administrative organisation and

therefore used original German maps. The existing territorial map of chiefdoms, kingdoms and sultanates are all works of German cartographers.

4.2. Security and strategy issues

Throughout modern military history, cartography appears as incontestable tool for strategists of yesterday as well as today. Many major territorial conflicts occurring between chiefdoms have been settled with the contribution of German cartography. Moreover, the German map work proved to be a kind of precious handbook in the border dispute that opposes Cameroon and Nigeria since several years Nigeria. It enlightened the members of the International Court of Justice (ICJ)⁴ In spite of the wealth of the German cartography, the post-colonial Cameroon show no proof its importance with regards to regional security and development.

4.3. Teaching and production of history and geography

In teaching history and geography, the role of the German colonial cartography has not been recognised in Cameroon. Despite the use of German colonial maps in history and geography, it is poor in comparison with expectations. The Cameroonian historians Eldridge Mohammadou and Adalbert Owona and the geographer Athanase Bopda are among the few scholars who actually used the german cartographic inheritance in their works (Mohammadou, E. 1978, 1982, 1994; Owona A. 1996; Bopda A.2003).

Research and the production of geography and history documents should normally seize the opportunity given by the German fund. However, little has been achieved on that field. Many reasons can be accounted for this little interests; the first being that more than 90% of postgraduate historian students decide each year to carry research on French and British periods(1916-1960/61). Secondly, the German language is a hindrance to Cameroonians since it had been abandoned and the recent efforts didn't succeed to reverse this tendency. The languages used in university studies are English and French.

5. CONCLUSION

As compared to modern cartographers, Moisel worked in extremely difficult conditions. Moisel and his team faced hostility and harshness of the environment of that time and financial difficulties due to domestic policy in Germany. The engineering constraints imposed by the archaic technology were however successfully overcome in regards to the number and quality of achievements. Contrary to British and French who had more interest in German cartography and quickly used it, Cameroonians have not yet got the width and the depth of such wealth. Cartography seems to decline continuously in the NIC despite the increasing number of personnel. The failure of NIC to satisfy its customers led some private and governmental agencies to bring to life well equipped mapping laboratories for their specific needs. These new born cartography institutes apply limited policies and techniques which do not include efforts to save the heritage from disappearing. Documents taken away from the archives by colonisers were more than those that were kept in Cameroon.

.Max Moisel's data gathering principles are not useless for the cartographers of today and especially for those of the Third World who are unable to follow the scientific and technical progress on the subject. Unfortunately, these convenient and little costly techniques are neglected to give some attention to the remote sensing and GIS.

Currently, numerous enigmas remain and cannot be clarified without further works. That reality reveals the limits of the present survey.

⁴ Land and Maritime Boundary between Cameroon and Nigeria (Cameroon v. Nigeria: Equatorial Guinea intervening) - Judgement - Merits [2002] ICJ 3 (10 October 2002) at http://www.worldlii.org/int/cases/ICJ/2002/2002_3.html#Heading2012

6. REFERENCES

- Beguin, Michèle.& Pumain, Denise. La représentation des données géographiques. Statistiques et cartographie. Paris, Armand Colin, 1994
- Bopda A., 2003, Yaoundé et le défi camerounais de l'intégration : a quoi sert une capitale d'Afrique tropicale ? CNRS Editions, Paris, 420p.
- Casti, Emanuela. Mythologies africaines dans la cartographie française au tournant du XIXe siècle in Cahiers de Géographie du Québec, vol.45, n°126, 2001, pp.429-450
- Colonial Literature and Maps: Kamerun at <http://www.zum.de/psm/imperialismus/kolonialatlas14/inhalt.php3>
- Deutsche Kolonialgesellschaft: <http://www.stub.bildarchiv-dkg.uni-frankfurt.de/dfg-projekt/bildprojekt/Lexikon/lexikon.htm>
- Dietrich Reiner (Ernst Vohsen) (ed.) „Bemerkungen zu der Karte des Gebietes am unteren Kampo (Karte 4) von M. Moisel“ in Wissenschaftliche Beihefte zum Deutschen Kolonialblatte. Mittheilungen Forshunsreisenden und geherten aus Deutschen Schutzgebieten, XV Band-3 Heft, Berlin, Ernst Siefried Mittler, 1902, pp.129-130
- Dietrich Reiner (Ernst Vohsen) (ed.) „Wegeskizze der Expedition des Hauptmanns von Schimmelpennig von NgütteII nach Yabassi“ in Wissenschaftliche Beihefte zum Deutschen Kolonialblatte. Mittheilungen Forshunsreisenden und geherten aus Deutschen Schutzgebieten, XIV Band-3 Heft, Berlin, Ernst Siefried Mittler, 1901, p147
- Dietrich Reiner (Ernst Vohsen) (ed.) „Begleiworte zu der Karte „Die Flussgebiete des Mungo und Unteren Wuri“ von M. Moisel“ in Wissenschaftliche Beihefte zum Deutschen Kolonialblatte. Mittheilungen Forshunsreisenden und geherten aus Deutschen Schutzgebieten, XIV Band-4 Heft, Berlin, Ernst Siefried Mittler, 1901, pp.214-223
- Delaunay Triangulation Method at <http://www.inf.ethz.ch/personal/cetin/thesis/thesis/node26.html>
- Gomsu, J. « L'autorité coloniale allemande et les systèmes politiques traditionnels au Cameroun (1884-1914) » in Cahiers d'Allemand et d'Etudes Germaniques, vol. 1. n°2, 1955, Université de Yaoundé, 1985.
- Joly F. La cartographie. Paris, PUF, coll. Magellan, 1976
- Hausen K. „Deutsche Kolonialherrschaft in Afrika. Wirtschaft Interessen und Kolonialverwaltung“ in Kamerun vor 1914. Switzerland : Atlantis Verlag Zürich und Freiburg, 1970.
- Hubatsch, Walther. Die Schutzgebiet des Deutschenreiches 1884-1920, Auszug aus Grundriss zur Bundes und Reichsbehörden 1815-1945, Band 22. Marburg, Lahn: Verlag J.G – Institut, 1984.
- Kamerun at <http://www.jaduland.de/kolonien/afrika/kamerun/index.html>
- Kienitz, Ernst. Zeittafel zur deutschen Kolonial Geschichte (mit 8 Karten und 13 Dokumenten) , München : Fichte Verlag / Paul Wustrow, 1941.
- Kum'a Ndumbé III (edited by) « Cent ans de relation entre l'Afrique et les Allemagnes, 1884-1984 : Le cas du Cameroun », Actes du Colloque international tenu du 8 au 14 avril 1985 à Yaoundé. Editions Africavenir, 1986.
- Land and Maritime Boundary between Cameroon and Nigeria (Cameroon v. Nigeria: Equatorial Guinea intervening) - Judgement - Merits [2002] ICJ 3 (10 October 2002) at http://www.worldlii.org/int/cases/ICJ/2002/2002_3.html#Heading2012
- Mann „Kamerun. Erforschung des Nun-Flusses(mit eine Kartenskizze)“ in Deutsches Kolonialblatt-Amtsblatt für die Schutzgebiete in Afrika und in der Südsee, 3, Berlin, pp76-77, 1912
- Mansfeld, „Skizze zu dem Berichte des Bezirksamtmanns Dr. Mansfeld über seine Dienstreise nach dem Obang-Lande“ in Deutsches Kolonialblatt-Amtsblatt für die Schutzgebiete in Afrika und in der Südsee, 9, Berlin, 1907, pp400-401
- Max Moisel at http://lucy.ukc.ac.uk/dz/Diko_web/moisel.html and at <http://www.stub.bildarchiv-dkg.uni-frankfurt.de/dfg-projekt/Lexikon-Texte/M/Moisel.html>
- Owona A., 1996, La naissance du Cameroun 1884-1914, L'Harmattan, Paris.
- "MAP." *Love To Know 1911, Online Encyclopedia.* 2003-2004: <http://51.191encyclopedia.org/M/MA/MAP.htm>

- MINREST/CGN Catalogue des publications du Centre Géographique National. Yaoundé, Doc. Ronéo, 1976, 25p.
- Rudin, H. Germans in the Cameroons, 1884-1914: A Case Study in Modern Imperialism. New-York: Greenwood press publishers, 1968.
- Saha, Zacharie. « Le Bezirk de Dschang : relations entre l'administration coloniale allemande et les autorités traditionnelles (1907-1914) ». Mémoire pour maîtrise en histoire, Université de Yaoundé, 1993.
- Seefried & al. „Die astronomischen Arbeiten der deutsch-französischen Grenzkommission Ostkamerun“ in Deutsches Kolonialblatt-Amtsblatt für die Schutzgebiete in Afrika und in der Südsee, 13, Berlin, 1907, pp627-628
- Simo Peka, Odette. « Übersetzung ausgewählter Dokumente der deutschen Kolonialzeit in Kamerun : Verhaten der Kameruner in der Kolonialen Situation ». Mémoire pour maîtrise, Université de Yaoundé (préparé à Sarrebruck, 1982-1983, Université de la Sarre).
- Surveyor's Compass, Theodolite, Universal Instrument at <http://americanhistory2.si.edu/surveying/index.htm>
- Inventaire des instruments scientifiques anciens dans les établissements publics at <http://www.inrp.fr/she/instruments/instruments.htm>
- Vohsen, Ernst (ed.) Karte von Kamerun in 31 Blatt und 3 Ansatzstücken in Maßtabe 1:300000 bearbeitet unter Leitung von Max Moisel. Begleitworte zu dem Blatt F1, Ossidinge. Berlin, Dietrich Reimer(Ernst Vohsen), 1910, 10p.
- Woodward D. "Introduction; Map-Making in Local Traditional Societies; The Classical Civilizations; Islamic Cartography; European Cartography from the Middle Ages to the 18th Century; Global Trends Since the 18th Century" Article online at http://encyclopedia.781534525/Cartography_History_of.html