

XXXVI.—*Geographical Notices.* No. XIV.

PROF. GUYOT'S MEASUREMENTS OF THE ALLEGHANY SYSTEM.—It is well known to the scientific men of this country that Professor Arnold Guyot of Princeton, New Jersey, has devoted a portion of his summer vacations for ten years past to the study of the different portions of the great Alleghany system which faces the Atlantic coast from Canada to Georgia. Several years ago he measured the highest peaks of the Adirondack, Green and White mountains, in the northern part of the chain, and more recently he has been at work on the southern portion of the system which is found to possess the most elevated peaks of the whole Appalachian chain. His determination of some of the highest peaks of the Black mountains of North Carolina was published in this Journal, for September, 1857.

By a private letter from Professor Guyot we learn that during last summer (1860) he has devoted two full months to further measurements in the south, in company with Messrs. Sandoz and Grand Pierre. The weather has been propitious and he has accomplished much work, having measured between one hundred and fifty and two hundred points in addition to those which were previously determined. He has extended his investigations as far as Georgia, and has seen the extremity of the Blue Ridge and the Unaka. It may now be affirmed with safety that the southern portion of the Alleghanies is better known so far as pertains to its hypsometry, than any other portion of the system. There is reason to hope that at an early day Professor Guyot will lay before the readers of this Journal, in detail, the results of his important and prolonged investigations; meanwhile the reader will be interested in the following partial summary of his observations in North Carolina.

These measurements sufficiently indicate the grand traits of structure of that loftiest portion of the Appalachian system. It may be seen that the Roan and Grand Father mountains are the two great pillars on both sides of the Northgate to the high mountain region of North Carolina, which extend between the two chains of the Blue Ridge on the east and the Iron and Smoky and Unaka mountains on the west. That gate is almost closed by the Big Yellow mountain. The group of the Black Mountain rises nearly isolated on one side in the interval between the two chains touching by a corner the high Pinnacle of the Blue Ridge, and overtopping all the neighboring chains by a thousand feet. In the large and comparatively deep basin of the French Broad Valley, the Blue Ridge is considerably depressed, while the western chain preserves its increasing height. Beyond the French Broad rises the most massive cluster of highlands, and of moun-

tain chains. Here the chain of the Great Smoky mountains which extends from the deep cut of the French Broad at Paint Rock, to that, not less remarkable, of the Little Tennessee, is the master chain of that region and of the whole Alleghany system. Though its highest summits are a few feet below the highest peaks of the Black Mountain, it presents on that extent of 65 miles a continuous series of high peaks, and an average elevation not to be found in any other district, and which give to it a greater importance in the geographical structure of that vast system of mountains. The gaps or depressions never fall below 5000 feet except towards the southwest and beyond Forney Ridge, and the number of peaks, the altitude of which exceeds 6000 feet, is indeed very large. On the opposite side, to the southeast, the Blue Ridge also rises again to a considerable height, in the stately mountains of the Great Hogback and Whiteside, which nearly reach 5000 feet, and keeps on in a series of peaks scarcely less elevated far beyond the boundary of Georgia.

Moreover the interior, between the Smoky mountains and the Blue Ridge, is filled with chains which offer peaks higher still than the latter. The compact and intricated cluster of high mountains, which form the almost unknown wilderness covering the southern portion of Haywood and Jackson counties, is remarkable by its massiveness and the number of lofty peaks which are crowded within a comparatively narrow space. The Cold mountain chain, which constitutes one of its main axes, shows a long series of broad tops, nearly all of which exceed 6000 feet. Near the south end, but west of it, not far from the head waters of the French Broad, the Pigeon and the Tuckaseegee waters, Mount Hardy raises its dark and broad head to the height of 6133. Still further, to the northwest, the group culminates in the Richland Balsam, 6425 feet, which divides the waters of the two main branches of Pigeon river and of the Caney fork of the Tuckaseegee. Amos Plott's Balsam, in the midst of the great Balsam chain, which runs in a parallel direction between the two main chains, measures 6278 feet. Considering therefore these great features of physical structure and the considerable elevation of the valleys which form the base of these high chains, we may say that this vast cluster of highlands between the French Broad and the Tuckaseegee rivers, is the culminating region of the great Appalachian system.

NEW MAP OF THE ALLEGHANY SYSTEM, BY MR. E. SANDOZ.—The measurements of Professor Guyot, just referred to, furnish important data for the correction as well as the completion of all existing maps of the regions which he has examined. These data, with the exception of those collected in the past summer, have been employed by Mr. Ernest Sandoz, a nephew of Prof. Guyot, and an accomplished draftsman, in the construc-

tion of a new map of the entire Alleghany chain, which has been published in the July number of Petermann's *Mittheilungen*. Mr. Sandoz had accompanied Mr. Guyot on many of his mountain expeditions and took the results with him to Gotha, where the chart was drawn and engraved under the direction of Dr. Petermann. To the editor of that excellent repository of geographical science, we are indebted for an early and proof impression of this map. As it is by far the most satisfactory chart of the Eastern portion of the United States in existence,—a request has been sent to Dr. Petermann to permit its republication in connection with this Journal, and there is reason to hope that at no distant day it may be laid before our readers, with a paper illustrative and explanatory of it, from the pen of Professor Guyot. The new edition when issued will contain some emendations derived from the more recent surveys to which allusion has been made.

The scale of the map is 1 : 6,000,000. Two detailed subordinate maps are printed on the same sheet with it, having a scale of 1 : 600,000, one of which gives the White Mts. of New Hampshire, the other the Black Mts. of North Carolina, both according to Mr. Guyot's measurements.

NARRATIVE OF A VOYAGE TO SPITZBERGEN IN THE YEAR 1613.—In the Transactions of the American Antiquarian Society, vol. iv. just published, S. F. Haven, Esq., the Society's Librarian, has edited with an introduction and notes, a Narrative of a Voyage to Spitzbergen made in the year 1613 at the charge of the English "Muscovey Company." Although this voyage is one of the series embraced in the celebrated collection of Purchas, commonly known as "His Pilgrimes," yet this account, which has been lying among the Manuscripts of the Antiquarian Society, has never before been printed. There is reason for believing, says Mr. Haven, that the Journal now first printed was from the pen of Robert Fotherby, whose name both as an author and as a skillful navigator is connected with two succeeding voyages.

"The expedition of 1613," he continues, "was fitted out with unusual care, and intrusted to the charge of some of the ablest men in the service. Besides the chief Captain, Benjamin Joseph, William Baffin and the author of our narrative, it was accompanied by Thos. Edge, who had already twice sailed to Spitzbergen. Purchas was indebted to Edge for the map of the coast inserted in his work, and also for a summary of Northern Discoveries which appears in the same volume. Baffin was attached to the ship of the commander of the fleet; and from that circumstance, apart from his personal reputation and the value of his scientific observations, his journal would naturally be the one selected for publication. The author of our account was in another vessel

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often separated from the rest. He thus experienced a different series of incidents or observed the same from a different point of view."

At this period when Arctic explorations are attracting so much attention, the printing of this early record is peculiarly acceptable. The introduction and notes, with which the paper has been enriched by the pen of its learned editor, illustrate many interesting points pertaining to polar discoveries. The cuts which accompany this edition are fac-similes (except in their size which is half that of the originals) from some rude drawings which are attached to the Manuscript.

DR. ENGELMANN'S MEASUREMENT OF THE ELEVATION OF ST. LOUIS, ABOVE THE GULF OF MEXICO.—In the Transactions of the Academy of Science in St. Louis, vol. i, No. 4, 1860, there is an article by Dr. Geo. Engelmann on the elevation of St. Louis above the Gulf of Mexico, from which the following statements are derived.

"A knowledge of the exact altitude of St. Louis is important as an element in the physical geography of North America, not only for the reason that this city stands, so to say, in the centre of the great Mississippi Valley and not far from the confluence of the four great rivers, the Mississippi, the Missouri, the Illinois and the Ohio, but, also, because most of the hypsometrical measurements throughout the northern and western regions of this valley and into New Mexico and Utah, made by the different explorers during the last twenty years and more, by Nicollet, Fremont, Owen, Wislizenus, Emory, Stansbury, and several of the Pacific Railroad exploring expeditions, took the altitude of St. Louis as their starting point, and were based to a great extent on the barometrical observations of those explorers compared with mine.

"Mr. J. N. Nicollet was the first who ascertained the elevation of St. Louis as well as a great many points on the Mississippi and Missouri rivers, as he was the first to give us a physical geography of the Mississippi Valley, based on careful instrumental observation. He laid down an abstract of his labors in his Report on the Hydrographical Basin of the Upper Mississippi, in 1841, published by order of the U. S. Senate, after his death, in 1843. On pages 93-101 he gives a detailed account of the methods employed to obtain the desired results, and on pp. 122-125 is contained a most valuable table of geographical positions, distances, and altitudes."

In this table, the altitude of St. Louis is stated to be 382 feet from which two feet must be deducted to reduce it to low water-mark.

Dr. A. Wislizenus next calculated the elevation of St. Louis. His results are published in his Report on a Tour to Northern

Mexico, printed by the U. S. Senate in 1848. They place the altitude of the present low water-mark at 389 feet 6 inches.

Dr. Engelmann's recent calculations and measurements give the height of the low water-mark at St. Louis at 374 feet 4 inches, a few feet lower than either of his predecessors had estimated it.

The following table shows their comparative results for three different points measured.

Height of St. Louis above the Gulf, in English feet.

	Nicollet.	Wislizenus.	Engelmann.
Engelmann's Barometric Station,	486·5	496·0	480·9
City Directrix,	410·5	420·0	404·9
Low water-mark,	380·	389·5	374·4

"Intimately connected with the altitude of St. Louis and other points along our river is the question of the fall of the river and the velocity of its current. Nicollet's tables, mentioned above, give us the only data at present available for an approximative estimation of the fall of the Mississippi in its different sections. The following little table, calculated from these data, explains itself:

	Distances in miles.		Fall in feet.		Fall of the River in feet per mile
	From point to point.	Total from St. Peter's.	From point to point.	Total from St. Peter's.	
Mouth of S. Peter's River to					
Prairie du Chien,.....	260	260	102	102	0·39
Rock Island,	210	470	114	216	0·54
Mouth of Desmoines,	128	598	84	300	0·65
St. Louis,	204	802	62	362	0·30
Mouth of Ohio,.....	174	976	58	420	0·33
Mouth of White River,	462	1438	122	542	0·26
Natchez,	348	1786	116	658	0·33
New Orleans.....	302	2088	76	734	0·25
Mouths of Mississippi,	104	2192	10	744	0·09
Or in the great natural sections of its course:					
Mouth of St. Peter's River to					
Prairie du Chien,	260	260	102	102	0·39
Mouth of Desmoines,	338	598	198	300	0·59
New Orleans,.....	1490	2088	434	734	0·29
Mouths of Mississippi,	104	2192	10	744	0·09
Total average fall of the Mississippi from mouth of St. Peter's River to the Gulf,....					0·34

"The Mississippi River has therefore an average fall of about 4 inches per mile; between St. Peter's and the Rapids, a little more; from the lower end of the Rapids to New Orleans, a little less; in the region of the Rapids, about 7 inches; and from New Orleans to the mouth, about 1 inch per mile. A further analysis of the tables shows the fall on both rapids to be 21 inches to the mile."

Dr. Engelmann then gives the following data, based, as he says, on his own "rather loose observations" respecting the velocity of the Mississippi. As he remarks on "the absence of all other information" on this point it seems proper for us to refer to Marr's Report of Observations at Memphis in 1849, and to Dr. Ellet's work, to the measurements of Riddell, Forshey, and Dickenson reported to the American Association, and to an article by Lyell in this Journal, [2], iii, pp. 36 and 118.

Date of Observation.	Height of River above low water.	Current per hour.	One mile in
1845. Feb. 20,	5 feet,	3·00 miles,	20 minutes.
" " 28,	10 "	3·50 "	17 "
1844. Mar. 5,	15 "	4·00 "	15 "
" Ap. 26,	20 "	5·00 "	12 "
1839. May 27,	21 "	5·09 "	11 $\frac{3}{4}$ "
1837. July 10,	27 "	5·55 "	10 $\frac{3}{4}$ "
1844. May 19,	27 "	5·68 "	10 $\frac{1}{2}$ "
" Jun. 22,	35 "	6·25 "	9 $\frac{3}{4}$ "

KIEPERT'S NEUER HAND ATLAS, (Berlin, Reimer: N. Y., Westermann, 1860.)—This admirable work which has been for some years in progress is at last complete, presenting a collection of forty maps of different portions of the world. They are drawn with great beauty and skill and the whole work is at once attractive, convenient and trustworthy,—as might indeed be expected from the reputation which the author enjoys as a cartographer. Our limits do not admit of an extended criticism on the several maps, but we append a list for the information of those who may wish to purchase a complete general Atlas for every day use.

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EXPLORATION OF WESTERN BRITISH AMERICA.—In the last number of this Journal a condensed account was given of the expeditions sent out by the Canadian Government for the exploration of the Red river and Saskatchewan districts. Since then, we have received several important Canadian documents, referred to in that article. As they possess a permanent value we subjoin a notice of their contents.

1. Report from the Select Committee on the Hudson's Bay Company, together with the proceedings of the Committee, minutes of evidence, appendix and index. Ordered by the House of Commons to be printed 31st July and 11th August, 1857.

This public document presents in the usual style of the Investigations of a Committee of a House of Parliament, a vast amount of matter relating to the affairs of the Hudson's Bay Company and the regions under their control,—derived from the examination of Hon. J. Ross, Col. Lefroy, Dr. Rae, Sir Geo. Simpson, Sir John Richardson and other gentlemen. It is accompanied by three maps; 1, of the British and Russian possessions in North America; 2, of the aboriginal tribes of British America; and 3, of the Northwestern portion of Canada, Hudson Bay and Indian Territories.

2. Papers relating to the Affairs of British Columbia. Part I. Copies of Dispatches from the Secretary of State for the Colonies to the Governor of British Columbia, and from the Governor to the Secretary of State relative to the Government of the Colony; also Copies of the Act of Parliament to provide for the Government of British Columbia; Governor's Commissions and Instructions; Order in Council to provide for the Administration of Justice; and Instrument revoking so much of the Crown Grant of the 20th May, 1838 to the Hudson's Bay Company for exclusive trading with the Indians as relates to the Territories comprised within the Colony of British Columbia. Presented to both Houses of Parliament by Command of Her Majesty, 18th February, 1859. London, 1859.

This blue book relating chiefly to Fraser's river and the gold discoveries has an outline sketch of the western portion of British America showing the different routes of communication, across the country to the mouth of the river.

3. Northwest Territory.—Reports of Progress together with a preliminary and general Report on the Assiniboine and Saskatchewan exploring Expedition, made under instructions from the principal Secretary, Canada. By HENRY YOULE HIND, M.A. in charge of the Expedition. Toronto, 1859.

4. Report on the exploration of the Country between Lake Superior and Red River Settlement and between the latter place and Assiniboine and Saskatchewan. By S. J. DAWSON, Esq., C.E. Printed by Order of the Legislative Assembly. Toronto, 1859.

A particular account of these expeditions was given in the last number of this Journal, p. 218.

5. Geological Survey of Canada. Report of Progress for the year 1858. Montreal, 1859.
6. Map of the Northwest part of Canada, Indian Territories and Hudson's Bay; compiled and drawn by THOS. DIVINE, Provincial Land Surveyor and Draftsman, by order of Hon. JOS. CAUCHON, Commissioner of Crown Lands, Toronto, March, 1857. Published by S. Derbeshire and G. Desbarats.

This is a map in outline, geologically colored, of the region above mentioned, extending as far north as 75° north latitude and as far south as 45° north latitude. Being made previous to the recent exploring expeditions it is now behind our present knowledge. The authorities on which it is based are J. Arrow-smith, A. Mackenzie, D. Thompson, the Admiralty and Coast Survey Charts, Pacific Rail Road Survey Reports. Sir Geo. Simpson, Governor of the Hudson's Bay Company, Sir Wm. Logan and others are also quoted. The isothermal lines are given according to Dove and Blodget.

7. Government Map of Canada from Red River to the Gulf of St. Lawrence, compiled by THOMAS DEVINE, Head of Surveys, Upper Canada Branch, Crown Land Department. November, 1859.

This map in three sheets, is limited to Upper and Lower Canada, the counties of which are distinctly indicated by color, and the more detailed topography is also clearly given. It is clearly drawn, and presents in its margin a variety of useful information respecting the resources of Canada.

DR. BARTH IN ASIA MINOR.—Dr. Henry Barth, the celebrated traveller in Africa, has published in a Supplement to Petermann's Mittheilungen an account of a journey which he made in 1857–1858 from Trapezund, through the interior of Asia Minor, by way of Tokat, Amássia, Yûsgad, Cesarea and Angora to Constantinople. His attention was directed to the physical structure of the country and also to the remains of ancient art. The archaeological inquiries which he made will hereafter be made public, in detail,—though many of the more important facts are brought out in Petermann with illustrative wood cuts. A sketch of his journey is given on an accompanying chart with plans of Tókat, Amássia, Kara-hissár and Kyr-schehr.

D. C. G.