fragments. This breccia is in masses surrounded by a deposit of finer-grained agglomerate which is nearly a square mile in extent. Other smaller masses of similar agglomerates were found five miles southeast of Roubaix. These occurrences are remnants of larger masses, for they have been subject to extensive erosion. The original vents are not preserved but their stocks are now represented by some of the dikes which occur at many places in the schists or overlying Paleozoic rocks.

These facts suggest that the Black Hills may have been the source of part if not all of the large amount of the volcanic ash which occurs intermixed and interbedded in the deposits of Oligocene age as well as in later formations in various parts of South Dakota and Nebraska.

N. H. DARTON

U. S. GEOLOGICAL SURVEY

INTERNATIONAL CONGRESS OF PREHISTORIC ANTHROPOLOGY AND ARCHEOLOGY

THE fourteenth International Congress of Prehistoric Anthropology and Archeology was held in the aula of the university, Geneva, September 9–14, 1912. On the evening of the 8th, Professor Eugene Pittard, president of the congress, and Professor Edouard Naville, honorary president, received the members informally at the Atheneum. The attendance was good throughout the week, 149 delegates being present from 112 institutions representing at least 20 nations, 12 of which sent government delegates. A. Hrdlička, George Grant MacCurdy and Charles Peabody represented the United States government. The total enrollment was nearly 600.

It had been over six years since the last congress (Monaco) was held. In view of the immense progress made in the domain of the prehistoric during this time, the program was exceptionally long and interesting. As no provision had been made for a division of the program into sections each treating a related group of subjects, it was necessary not only to limit each speaker to ten minutes, but also to abridge the discussion far beyond a desirable limit. Fortunately, however, many of the papers were supplemented by generous exhibits of original specimens, casts, drawings, plans, photographs, etc., for which the university furnished suitable cases and ample wall space conveniently located. The large collection of original specimens from Spain including remains of *Elephas antiquus* associated with a Chellean and perhaps pre-Chellean industry, and the Celti-iberian sepultures, exhibited by the Marquis of Cerralbo deserve special mention. Other exhibitors, to all of whom the thanks of the members present are due will be indicated in the program that is to follow.

The following amendments to the constitution recommended at the Congress of Monaco, were adopted at the first seance of the Geneva Congress and went immediately into effect:

> The official language of the congress is French; it is used for the publication of the proceedings and the correspondence of the commission of organization and of the committee. However, the members of the congress may, in their letters, communications or readings, make use of German, English or Italian. Communications in these three languages shall be accompanied by a résumé in French, and the discussions before the congress shall continue to be made in French.
>
> The maximum number of communications which any author may enter on the program is limited to four.

At the same seance an anthropometric commission consisting of the following members was appointed to continue the work of unification of anthropometric measurements begun at the Congress of Monaco[1] and to report at the close of the session:

MM. Chantre (France), Czekanowski (Russia), Duckworth (Great Britain), Frassetto (Italy), Giuffrida-Ruggeri (Italy), Godin (France), Hillebrand (Hungary), Hoyos Sainz (Spain), Hrdlička (United States), Loth (Russian Poland), von Luschan (Germany), MacCurdy (United States), Manouv-

[1] Compte Rendu, Congr. intern. d'anthr. et d'archéol. préhs., 13e session, Monaco, 1906, tome II., pp. 377–394.

rier (France), Marett (Great Britain), Mayet (France), Mochi (Italy), Musgrove (Great Britain), Pittard (Switzerland), Rivet (France), Schlaginhaufen (Switzerland), Sergi (Italy), Sollas (Great Britain), Volkov (Russia), Weisgerber (France).

This commission held four meetings, on the 11th from 8 o'clock till noon under the presidency of Manouvrier; on the 13th from 8 o'clock till 11 and from 3 till 4 under the presidency of Sergi; on the 14th from 9 till 10 under the presidency of Duckworth.

The reporters appointed were Duckworth, Rivet and Schlaginhaufen.

The entire report was adopted unanimously by the commission in the meeting of the 14th, and by the congress on the same day in its closing session.

International Agreement for the Unification of Anthropometric Measures on the Living

General Principles

(*a*) For measurements on living subjects, the upright position is adopted.

(*b*) The projection method is adopted, except in cases where special mention is made of a different method.

(*c*) For paired measurements, it is recommended to operate on the left side and to take bilateral measurements for the height of the acromion and the great trochanter above the surface on which the subject stands.

(*d*) Observers are urged always to indicate precisely their method and instrumentation.

(*e*) It is very particularly recommended to persons desirous of using anthropometry not to be content with a theoretical study of the measuring processes, but to learn them practically in the different laboratories where they are taught.

Measures in Detail[2]

1. *Height.*—Subject standing on a horizontal firm surface (not leaning against a vertical wall or support), the arms pendent, the palm of the hand turned inward, the fingers vertical, the heels touching, the eyes directed horizontally. In this position measure the height of the vertex above the horizontal surface on which the subject stands.

*2. *Auditory Opening.*—Starting point: the deepest portion of the notch between the tragus and the helix (point already adopted at the Monaco Congress, op. cit., p. 391).

*3. *Chin.*—Starting point: median point on the inferior border of the mandible.

*4. *Presternal Notch.*—At its lowest point.

*5. *Nipple.*—Start from its center. Exclude women with pendent breasts.

*6. *Umbilicus.*—Center of the umbilical cicatrice.

*7. *Pubis.*—Median point on the superior border of the pubis. In cases where it is difficult to locate this point, be guided by the lower ventral fold.

*8. *Spinous Process of the Fifth Lumbar Vertebra.*—To find this point easily, cause the trunk of the subject to be flexed, a position in which the spinous process in question is indicated by a prominence.

9. *Height Sitting.*—Cause the subject to be seated on a stool, horizontal and firm, 30 to 40 cm. in height (this height varying with the height of the subject), the legs flexed. Place the back in contact with a vertical plane or with the anthropometer at the level of the sacral region and between the two shoulder blades. The head should be in the same position as for the height standing. Measure the height of the vertex above the horizontal plane of the stool.

10. *Height of the Pelvis.*—The subject being in the position for the height sitting, measure the height of the summit of the iliac crest above the plane of the stool.

*11. *Acromion.*—Upper external border of the acromion.

*12. *Great Trochanter.*—Upper border of the great trochanter.

*13. *Anterior Superior Iliac Spine.*—Summit of this spine. In cases where it is difficult to find this point, follow Poupart's ligament to its point of insertion, which is precisely the spine in question.

*14. *Elbow.*—Radio-humeral line.

*15. *Wrist.*—Inferior point of the styloid process of the radius.

*16. *Extremity of the Middle Finger.*

*17. *Knee.*—Point on the upper margin of the internal tuberosity of the head of the tibia.

*18. *Ankle.*—Inferior point of the internal malleolus.

*19. *Stretch.*—Place the subject against a wall, the arms extended horizontally, the hands completely open, the palm forward, and measure the

[2] Translated from Dr. Rivet's copy. Measures marked by an asterisk are those for which the subject should be in the same position as for the height (measure No. 1).

distance from the extremity of one middle finger to that of the other. If no wall is to be had, place the rigid anthropometer horizontally behind the subject, whose position should be the same as above described, and take the same measure. Whichever method is employed, demand of the subject the maximum extension.

*20. *Biacromial Diameter.*—Maximum distance between the two acromions.

*21. *Bihumeral Diameter.*—Maximum distance between the two deltoid prominences (measure of secondary importance).

*22. *Bimamelon.*—Distance between the centers of the two nipples (same observation as for measure No. 5) (secondary measure).

*23. *Biiliac Diameter.*—Maximum distance between the external margins of the iliac crests.

*24. *Bispinal Diameter.*—Distance between the two anterior superior iliac spines (cf. measure No. 13).

*25. *Bitrochanteric Diameter.*—Maximum distance between the external faces of the great trochanters. It is necessary to press firmly against the tissue.

*26. *External Antero-posterior Diameter of the Pelvis.*—Starting points: in front, upper border of the pubis and in a median line; behind, summit of the spinous process of the fifth lumbar vertebra.

*27. *Transverse Diameter of the Thorax No. 1.*—Measured in a horizontal plane at the level of the xiphoid appendix. Take the average of the measures noted during inhalation and exhalation, or take the measure in an intermediate state.[3]

*28. *Transverse Diameter of the Thorax No. 2.*—In a horizontal plane at the level of the upper border of the fourth chondro-sternal articulation (secondary measure).

*29. *Antero-posterior Diameter of the Thorax No. 1.*—In the same plane as measure No. 27.

*30. *Antero-posterior Diameter of the Thorax No. 2.*—In the same plane as measure No. 28 (secondary measure).

*31. *Height of the Sternum.*—Measured with sliding compass from the lowest point of the presternal notch to the base of the xiphoid appendix.

32. *Bicondylar Diameter of the Humerus* (secondary measure).

33. *Bistyloid Diameter of the Forearm* (secondary measure).

[3] For measures Nos. 27–29 it is necessary to employ calipers with large blunt extremities, as the points of ordinary calipers would slip into the intercostal spaces, thus falsifying the results.

34. *Bicondylar Diameter of the Femur* (secondary measure).

35. *Bimalleolar Diameter* (secondary measure).

*36. *Thoracic Circumference.*—In a horizontal plane at the level of the base of the xiphoid appendix (secondary measure).

37. *Circumference of the Neck.*—The smallest circumference.

38. *Circumference of the Arm.*—The maximum circumference below the deltoid, the arm being in a state of repose.

39. *Circumference of the Arm in Contracted State.*—Maximum circumference at the same level as measure No. 38 (secondary measure).

40. *Maximum Circumference of the Forearm.*—At the level of the epitrochlear and epicondylar muscles.

41. *Minimum Circumference of the Forearm.*—Above the styloid processes of the radius and ulna.

42. *Maximum Circumference of the Thigh.*—At the level of the gluteal fold.

43. *Minimum Circumference of the Thigh.*—Just above the knee.

44. *Circumference of the Calf.*—The maximum.

45. *Minimum Circumference of the Ankle.*

46. *Minimum Circumference of the Waist.*

47. *Contour of the Hand.*—The right hand is applied on a leaf of paper, the fingers moderately separated, the axis of the middle finger in line with the axis of the forearm. Mark the two extremities of the bistyloid line, from these points trace the contour of the palm and fingers with a pencil cleft longitudinally and held perpendicular to the paper. Mark by points the termination of each interdigital space and the metacarpo-phalangial articulation at each side.

48. *Contour of the Foot.*—The right foot is placed on a leaf of paper, the leg being perpendicular to the paper. Mark by a stroke the extremities of the malleoli and the metatarso-phalangial articulation at each side; then trace the contour of the foot and toes in the same way as for measure No. 47, indicating the termination of each interdigital space. It is useless to trace the internal border between the malleolar and the metatarso-phalangial points, as it would always be inexact.

49. *Height of the Arch.*—The foot in the same position as for measure No. 48, measure by means of a vertical sliding compass the vertical distance from the plane of support to the upper border of the scaphoid (secondary measure).

The Anthropometric Commission as well as

the congress unanimously adopted the following technique and resolutions:

RECONSTRUCTION OF THE HEIGHT BY THE AID OF THE LONG BONES

To reconstruct the height by the aid of the long bones, measure the maximum length of these bones, with the exception of the femur, which is to be measured in position, and of the tibia, which is likewise to be measured in position, without the spine.

Resolutions

1. *Resolved,* that for the graphic representation of skulls, anthropologists employ the horizontal plane either of Broca or of the Frankfort agreement.

2. *Resolved,* that anthropologists publish integrally all their measures.

It was voted to recommend to the next congress, which will no doubt be held at Madrid in 1915, an amendment to the constitution admitting Spanish on the same footing as English, German and Italian (a similar recommendation to admit all the Slavic languages was rejected); also that hereafter the program be divided into sections: (1) the stone age, (2) the age of metals and (3) anthropology properly so called (somatology), with the understanding, however, that communications comprehensive in character should still be treated in general session.

The following resolutions were adopted:

1. Asking Slavic societies and authors to give résumés of their publications in French, German or Latin.

2. That in view of the danger to originals from fire and theft, museums possessing important prehistoric or protohistoric objects made of precious metals be asked to have the same reproduced in metal or plaster.

3. That this congress enter into amical relations with an international congress[4] now in process of formation and destined to cultivate particularly the field of ethnography and physical anthropology.

The council in which this last resolution took shape were of the opinion that the name eventually to be chosen for the new congress should not be such as would lead to confusing it with that of the existing congress, and that the two should not meet in the same year. The fifteenth session of the International Congress of Prehistoric Anthropology and Archeology will be held in 1915, at Madrid in case of an official invitation. The new international congress, as yet unnamed, will probably take final shape at the Washington meeting of the International Congress of Americanists, and the first session perhaps called for 1916.

[4] See Science, N. S., XXXV., 980, 1912.

The one fact that stood out most impressively at Geneva was the recent development of the prehistoric in Spain, on the one hand by the Marquis of Cerralbo and on the other by the Institut de Paléontologie Humaine in Paris, an international institution founded by the Prince of Monaco. Within the last five years the Marquis of Cerralbo has in his private capacity excavated fifty-two prehistoric stations and is now carrying on work at ten. Through his efforts the government of Spain founded last June a Commission de Exploraciones Espeleologicas, a branch of the Instituto Nacional de Ciencias Naturales. This foundation was inspired in a large measure by the success of the Institut founded by the Prince of Monaco. It is fortunate that prehistoric archeology should have the powerful support of two such influential men, both of whom received a special vote of thanks of the congress. Another name that should not be overlooked in this connection is that of M. Louis Siret, a Belgian with large business interests in Spain, who for many years has made good use of his exceptional archeological opportunities. If the present rate of progress continues along these lines during the next three years, the Madrid congress will be a pilgrimage that no prehistorian can afford to miss.

The social functions of the week were especially well regulated and highly enjoyed by all present. Each member was given a "carnet" which contained not only the dates and places of the events, but also free coupon tickets to and from each function. On Monday from 5 to 8:30 P.M. Professor Edouard Naville (honorary president) and Mme. Naville received at their beautiful country place, Malagny, near Geneva. The whole of Tues-

day afternoon was devoted to an excursion to Salève, where President Pittard gave an interesting talk on "The Prehistoric of the Environs of Geneva." Thursday afternoon the city council of Geneva received at the Ariana Museum; and in the evening Professor Oscar Montelius, of Stockholm, gave an illustrated lecture on "The Relations between Italy and Central Europe during the Bronze Age." A tour of the Lake of Geneva (or Lake Léman as the inhabitants of the Canton of Vaud prefer to call it) occupied the whole of Thursday with luncheon in the historic Castle of Chillon offered by the state council of the Canton de Vaud, and dinner on board the boat offered by the local committee of the congress. The city waterfront was brilliantly illuminated for the return at 8 P.M. The city of Geneva was hostess Friday afternoon from 4 to 6 at the new Museum of Art and History (containing also important prehistoric collections). The same evening Professor Émile Cartailhac lectured before a large audience in Victoria Hall on "Man of the Caverns." The official banquet in the foyer of the theater Saturday evening offered by the state council of the Republic of Geneva and followed by a representation of a "Fête Montagnarde" closed the festivities of the week. It was made the occasion of the official announcement of the founding of an Institute of Anthropology at Geneva, that President Eugene Pittard was to be the director and that in addition to the professorship, ample funds had been raised by private subscription to meet the annual needs of such an institute. In preparation for, and especially during the week of the congress, Professor Pittard abundantly demonstrated his fitness for the new post to which he has been called; and Geneva did well to honor him in the presence of his colleagues assembled from all parts of the world.

About forty members accepted the invitation to take part in a five days' excursion (September 16–20) to important lake dwellings and museums—Bevaix (Treytel), Neuchâtel, St. Blaise, La Tène, Bienne, Bâle, Zürich, Lucerne, Lausanne.

The following is a complete list of the papers presented at the congress:

J. Bayer: "The Glacial Periods (theories of Penck)."

Abbé H. Breuil: "The Subdivisions of the Upper Paleolithic and their Significance."

J. Hillebrand: "The Paleolithic Cavern of Pesko, Hungary." (Exhibit of original specimens.)

L. Capitan: "The Evolution of the Stone Industry during the Paleolithic."

Marquis of Cerralbo: "Torralba, the Most Ancient Station of Europe in which Archeological Remains have been found." (Exhibit of original specimens.)

V. Commont: (1) "Chronology and Stratigraphy of Neolithic and Paleolithic Industries in the Holocene and Pleistocene Deposits of Northern France, especially in the Valley of the Somme." (2) "A Mousterian Industry Associated with a Warm Fauna in the Valley of the Somme." (Exhibit of original specimens.)

A. Mochi: "The Succession of Paleolithic Industries and Changes in the Pleistocene Fauna in Italy." (Exhibit of original specimens.)

M. Anton: "New Quaternary Crania from Spain." (Exhibit.)

L. Capitan and D. Peyrony: "The Recent Discovery of Two Mousterian Skeletons at La Ferrassie (Dordogne)."

L. de Hoyos Sainz: "Crania of the Cro-Magnon Type from Old Castille." (Exhibit of photographs and maps.)

R. R. Marett: "Prehistoric Man in Jersey."

M. Boule: (1) "*Homo neandertalensis* and the Place it should occupy among the Hominidæ." (Exhibit of casts.) (2) "The Institute of Human Paleontology in Paris."

Giuffrida-Ruggeri: "A Scheme of Classification for Living Hominidæ."

Count Bégouen: "A New Cavern with Parietal Engravings in the Department of Ariège: the Cavern of the Tuc d'Audoubert." (Exhibit.)

Abbé H. Breuil and L. Capitan: "Engravings on Stalagmite from the Cavern of Teyjat, Dordogne." (Exhibit of original drawings.)

I. Dharvent: "The First Step in the Prehistoric Art of Europe."

M. Hoernes: "The Prehistoric Art of Europe by Epochs and Regions."

B. Reber: (1) "The Age and Significance of the Prehistoric Engravings." (Exhibit.) (2)

"Certain Series of New Prehistoric Engravings." (3) "Prehistoric Fortification in the Neighborhood of Geneva."

S. Reinach: "Some Specimens of Cavern Art."

L. Coutil: "Tardenoisian, Capsian, Getalian, Geneyenian (geometric flints)." (Exhibit.)

L. Didon: "An Aurignacian Station near Sergeac."

G. Jousset de Bellesme: "Comparative Technique in the Amygdaloid Type of Industry."

The Abbés H. Obermaier and H. Breuil: "Excavations at the Cavern of Castillo (Spain)."

G. Lalanne: (1) "The Venus of Laussel." (Exhibit of casts.) (2) "Azilian Stations on the Shore of Bas Medoc."

E. Pittard: (1) "The Prehistoric in the Valley of Rebières." (2) "Aurignacian Station: Les Rebières II." (Exhibit of original specimens.)

E. Pittard and R. Montandon: "An Aurignacian Microlithic Industry." (Exhibit of original specimens.)

R. A. Smith: "An Aurignacian Facies in England." (Exhibit of original specimens.)

Th. Volkow: "Recent Discoveries in a Paleolithic Station at Mélène, Ukraine." (Exhibit of original specimens.)

M. Baudouin: "The Orientation of Dolmens."

Baron A. Blanc: "Excavations in Savoy: Preliminary Results, Azilian, Neolithic, Eneolithic and Protohistoric."

Marquis of Cerralbo: (1) "Iberian Necropoles." (Exhibit.) (2) "Neolithic Monuments of Central Spain."

H. Corot: (1) "Prehistoric and Protohistoric Times in Alesia." (2) "The Excavation of a Tumulus at Minot, with Incineration 'in domo.'"

Abbé F. Hermet: (1) "Statue Menhirs of Aveyron and of Italy." (2) "Bronze Spheroids." (3) "The Sepulcral Cavern of Nant."

R. A. Stewart-Macalister: (1) "Some Excavations recently made in Ireland." (2) "A Neolithic Cavern at Ghezer (Palestine)."

D. MacRitchie: (1) "Cyclopean Constructions in Scotland." (2) "The Kayak in Northeastern Europe." (3) "Pygmies among the Ancient Egyptians and the Hebrews."

J. de Saint-Venant: "Some Curious Iron 'Tranchets' of the La Tène Period."

Mme. Barnett: "Prehistoric Stone Amulets from Teotihuacan, Mexico."

A. Hrdlička: "The Remains in Siberia, Mongolia and other Parts of Eastern Asia of a Race that Peopled America."

Charles Peabody: "The Present State of the Question of Diluvial Man at Trenton, New Jersey."

N. H. Winchell: "Prehistoric Man in Kansas." Read by Dr. Peabody. (Exhibit of original specimens.)

L. Siret: "Comparative Study of the Symbols Represented on Protohistoric Monuments or Objects."

M. Baudouin: (1) "Comparative Study of Pediform Sculptures and Engravings." (2) "Comparative Study of Engravings Representing the Horse's Foot."

J. Déchelette: "Origin and Use of Iron in Europe."

M. Exsteens: "Industry of the Extinct Tasmanians."

H. Müller: (1) "Stations with Azilian Facies from the Neighborhood of Grenoble." (2) "The Necessity of an International Commission on Archeological Nomenclature."

Mme. Crova: "Neolithic Implements from the Coast of Mauritania, Africa." (Exhibit of original specimens.)

H. S. Wellcome: "Prehistoric Discoveries in the Soudan." (Exhibit.)

F. Huybrigts: "The Earliest Manifestations of Religious Ideas by Neolithic and Druidic Populations according to the Discoveries made at Tongres, Belgium." (Exhibit.)

L. Schaudel: "Pitted Stones, their Origin, Significance and Destination."

G. B. M. Flamand: (1) "Prehistoric Sahara." (2) "The Worship of the Sun in Prehistoric Times."

F. Sarasin: "Colored Pebbles from the Cavern of Birseck, near Bâle." (Exhibit of original specimens.)

G. Nicole: "Prehistoric Vases from Thessaly."

H. Hubert: "The Androphagous Carnivor of the Gundestrup Vase." Read by S. Reinach.

G. Reubel: "An International Organization for the Anthropometry of Children."

P. Godin: "The Relation between the Evolution of Growth and Puberty."

S. Reinach: "An Iberian Ornament." (Exhibit.)

H. M. Ami: "The Status of Archeological Work in Canada."

L. Bidault de Grésigny: "Prehistoric Researches in the Saône Valley."

C. Florence: "How to Recognize the Age of Ferruginous Scoria."

George Grant MacCurdy
Yale University