

out; it is the geometric form of its occipital, which is nearly square.

It is certain that this does not constitute (and less in an isolated case such as the present) a racial characteristic; it is presented only as data that will aid in the study of the morphology of the occipital bone, which it is thought will supply the explanation of its anomaly. It is useless to expound the theory of the development of the occipital, for it is well known by all who occupy themselves with the anatomical sciences.

In all of my studies I have never encountered a similar case and it is desirable that this isolated datum may be utilized. For this reason it is brought to the attention of the fellows of this Association.

This paper was illustrated by a photograph and read by title.

*Evanescent Congenital Pigmentation in the Sacro-Lumbar Region:* HARRIETT NEWELL WARDLE.

The purpose of this paper was not to record any new observation, but to call to the attention of American anthropologists the various aspects of the questions relating to the occurrence of well-defined pigmented areas, chiefly in the sacro-lumbar region common upon a large percentage of the children of certain of the darker races. The stigmata fade away in from two to eight years. Their presence has been observed sporadically over a wide geographic territory reaching from Greenland in the east to Madagascar in the west—Danish Greenland, Vancouver, Hawaii, Samoa, Korea, Japan, China, the Philippines, the Celebes, Java, Malay archipelago, Indo-China, Madagascar,—thus appearing in many ethnic divisions. Nevertheless they have been elevated to the position of a racial character and called 'Mongolian marks.' No effort has as yet been made to inquire into their biological significance.

The hypothesis is offered that these evanescent congenital pigmented areas are the nuclei of more general pigmentation, the regions wherein occurs the first deposition of the cutaneous pigment normal to the darker races and peoples, and that their apparent disappearance may be explained by the deepening of the tint of the whole body surface. When it is remembered that the cells of the rete mucosum are derived from those of the dermis, the fact becomes very significant that the pigment of the so-called Mongolian marks is situated, not in deep epidermal cells, but in the underlying dermal tissue, for it would seem to be precisely in the latter layer that the earliest carbonous deposit should be expected.

This paper was read by title.

The newly elected officers for the Washington meeting are:

*Vice-President*, George A. Dorsey, Curator of Anthropology of the Field Columbian Museum, Chicago.

*Secretary*, Roland B. Dixon, Instructor in Anthropology, Harvard University, Cambridge.

HARLAN I. SMITH,  
*Secretary.*

#### THE NORTH CAROLINA SECTION OF THE AMERICAN CHEMICAL SOCIETY.

THE sixth annual meeting of the North Carolina Section was held on Saturday, May 17, 1902, at 11 A.M. in the office of State Chemist, Agricultural Building, Raleigh.

After the transaction of some miscellaneous business the following resolution was unanimously adopted:

In the death of Hugh Lee Miller on February 5 last the North Carolina Section of the American Chemical Society sustained its first and deep loss of one of its charter members. After graduation from the State University in 1890, where he served one year as assistant in the chemical department, he acceptably filled an instructorship in the Agricultural and

Mechanical College. His efficiency and refined character evidenced themselves in the affection of his students. He carried his culture and high standard of rectitude into commercial work, serving as chemist and subsequently general manager of the Nauas-sa Guano Co., of Wilmington, N. C. On the absorption of that corporation by the Virginia-Carolina Chemical Company he was promoted to the position of superintendent in charge of South Carolina Division. He was married, April 10, 1901, to Miss Purden Smith, of York, Pa. The dread disease phthisis deprived technical chemistry in the South of an able, conscientious, high-minded worker, and us of a much beloved friend.

The officers elected for the ensuing year were:

*President*, Chas. E. Brewer; *Vice-President*, G. S. Fraps; *Secretary-Treasurer*, C. B. Williams; *Councilor*, B. W. Kilgore; and *Executive Committee*, Chas. E. Brewer, G. S. Fraps and C. B. Williams.

The program as presented and discussed was as follows:

*Molecular Attraction: J. E. MILLS.*

Assuming that the total intrinsic energy of a molecule is the same in the liquid as in the gaseous state, it is shown that the change in the latent heat of vaporization at different temperatures can be accounted for, to a fair approximation, on the supposition that the attraction between the molecules varies inversely as the square of their distance apart. Other lines of argument advanced to prove this assumed law of attraction agree well with the observations.

The conclusions drawn are that the molecular attraction, like the attraction of gravitation, varies inversely as the distance apart of the molecules and does not vary with the temperature. Unlike gravitation, the attraction does not depend *primarily*

upon the mass, but upon the chemical constitution of the attracting molecules.

The paper is mathematical and not suitable for abstraction. It will appear in the *Journal of Physical Chemistry*.

*Bromination of Heptane under Pressure:*

ALVIN SAWYER WHEELER.

As the best yield of  $\beta$ -heptyl bromide gotten by Venable was only 30 per cent. of the theory, an attempt was made to increase it by conducting the bromination under pressure. The reflux condenser was attached to a jar filled with solid potash to absorb the hydrobromic acid. To the further end of the jar was attached a tube extending 190 mm. under mercury. The bromine was forced into the reaction flask by air pressure. The yield of  $\beta$ -heptyl bromide was not increased. However, the yield was increased to 36 per cent. by using an excess of bromine, the higher bromination products also increasing and the unchanged heptane decreasing considerably. But this experiment was carried out at atmospheric pressure.

*Notes on the Occurrence of Cobalt in Wake County, North Carolina: S. E. ASBURY.*

*Action of Chloral Upon the Nitranilins:*

ALVIN SAWYER WHEELER and H. R. WELLER.

The work done by Baskerville and Eibner, independently, upon the condensation of chloral with para-nitranilin was extended to the ortho- and meta-nitranilins. The reactions are readily carried out in benzol. Two molecules of a nitranilin condense with one molecule of chloral to form a trichlormethylendi-nitrophenylamine. They are all beautiful crystalline substances. The para and ortho bodies are very stable while the meta is easily decomposed. By working in the cold, additional products may be formed first.

*The Determination of Starch in Baking Powders:* W. M. ALLEN.

*Arsenic Pentachloride:* CHAS. BASKERVILLE and H. H. BENNETT.

Penta-halogen compounds of arsenic in which one or more chlorine atoms have been replaced by organic radicals are well known. Sloan (*Chemical News*, 46, 194) prepared  $\text{AsI}_5$  and Marignac obtained  $\text{AsF}_5$ . Many workers have failed to prepare  $\text{AsCl}_5$ —although Sloan (*Chemical News*, 42, 180) produced a body answering to the formula  $\text{As}_2\text{Cl}_8$  stable at  $15^\circ \text{C}$ ., having saturated the trichloride with chlorine at  $-23^\circ$ . The authors prepared  $\text{AsCl}_5$  by following out the same procedure at the temperature of solid carbon dioxide. The greenish-yellow liquid was stable up to  $-28^\circ \text{C}$ .; readily lost chlorine with elevation of temperature; dissolved in carbon disulphide and absolute ether cooled to  $-30^\circ$ , crystallizing from the latter on lowering the temperature a few degrees.

*Preparation of Pure Præodmium Compounds:* CHAS. BASKERVILLE and J. W. TURRENTINE.

The beautiful but tedious and time-consuming method of Carl Auer, who split didymium into neo- and præodmium, has been followed with alterations in detail by the subsequent workers, viz., von Scheele, Brauner, Dennis and most recently H. C. Jones. The method depends upon prolonged fractional crystallization of a water solution of the double præodmium ammonium nitrate acidified with nitric acid. This paper gives an account of a partial repetition of that process, some unsuccessful efforts to improve upon it, and finally a method giving very satisfactory results.

Experiments seeking the separation by fusion with sodium peroxide, potassium disulphate; precipitation by potassium chromate (Muthman) and iodate (Gibbs)

and formaldehyde, gave negative results or observations were made not sufficiently encouraging to warrant further pursuit.

The final method depended upon saturating a cold concentrated citric acid solution with fairly pure præodmium hydroxide, free from ammonia and excess of water. This solution when filtered and heated precipitated a beautiful green citrate, which is insoluble in boiling water, being rapidly washed by the same in a hot funnel until free from acid. Neodmium and lanthanum citrates do not act this way. The purity of the body was determined with a large Rowland grating by Dr. W. J. Humphreys, who made the examinations of the materials used by Jones.

*The Sulphur Contents of Some Vegetable Materials:* W. A. WITHERS and G. S. FRAPS.

As the average of a number of analyses, we find the ash of plants to contain only a portion of the total sulphur, as follows: cottonseed meal, one-sixth; cottonseed hulls, one-fifth; oats, one-tenth; cowpeas, one-sixth; corn, one-fortieth; peanuts, one-third; tobacco, four-fifths. Plants contain much more sulphur than has generally been considered to be the case. Corn and oats contain more sulphur (as  $\text{SO}_3$ ) than potash, soda, lime or magnesia. It is probable that sulphur plays a greater role in plant nutrition than has been suspected.

*Methods of Determining Sulphur in Plants:* G. S. FRAPS.

The paper is an account of a study of several methods. Evaporation with nitric acid and subsequent ignition with the addition of calcium acetate seems to be the best method.

*Determination of Sulphuric Acid in Soils:* C. B. WILLIAMS (See *Jour. Am. Chem. Soc.*, Vol. XXIV., p. 658-661).

*The Deportment of Pure Thorium and Allied Elements with Organic Bases:* CHAS. BASKERVILLE and F. H. LEMLY.

Miss Jefferson (Doctorate Dissertation, University of Penn., 1901) used acid-free pure nitrate in her study of the effect of certain organic bases on thorium salts. This work was repeated, verified and new observations made, namely, in certain cases (phenyl-hydrazine for example) two distinct precipitates were obtained which, mixed, corresponded with the results cited. The work was extended by the use of other bases, including many alkaloids. The accepted pure thorium nitrate, sulphate, and oxychloride were tested side by side with Baskerville's repurified tetra-chloride (*Journ. Am. Ch. Soc.*, 23, 761, 1901), and the volatile chloride (Weisser dampf of Berzelius, *Pog. Am.*, 119-155, 1863). All solutions were of known strength. The sulphate was found to be most readily precipitated by organic bases and good qualitative reactions verifying former work on the complexity of thorium were obtained.

*Rediscovery of a Process for Rendering Phosphoric Acid Available:* CHAS. BASKERVILLE.

In endeavoring to secure a mechanical method for concentrating phosphatic pebble overlaying the Eocene marl of the coastal plain region of North Carolina (Castle Haynes Mines) the concentric structure of many of the nodules was redetermined (Penrose, *Bull. U. S. Geol. Survey*, 46, 71). A number of analyses of carefully selected pebbles were made and in no case, except with the fossil teeth, which occur in the deposit to a greater or less extent, could samples be had which contained less than fifteen or twenty per cent. each of silica and limestone.

The chemical methods for increasing the content of phosphate were unsuccessful from an economic point of view. Jigged

material could be had which contained from 35 to 44 per cent. of tricalcium phosphate, so methods of fusing with substances like alkaline sulphates, sulphides, nitrates and finally carbonates were tried. The last was thoroughly successful, the nitrates giving the largest percentage of citrate soluble phosphoric acid, but the expensive nitrogen was driven off. Knoop (*Bied. Centr.*, B. 28, 576) heated phosphates, bones, etc., with alkaline silicates and obtained a 99-per-cent. yield of 'available phosphoric acid.'

G. A. Liebig (U. S. Patent 241,868, 1881) heated the same materials with carbon and Wiborgh (U. S. Patent 601,089, 1898) secured the American rights for a process the same as the author's, having preceded him by a few months. The process is of value in those countries where chamber acid is dear (Sweden) and large deposits similar to the North Carolina carbonaceous and silicious phosphates are found as recently noted in Japan. (*SCIENCE*, X., 900.)

*A Bath for Hot Precipitations:* CHAS. BASKERVILLE.

A spiral of block tin passes through a tall copper bath arranged to promote a constant flow of hot oil. The clear solution enters at the top and drops from the bottom precipitated into a heated filtering apparatus. The suggestion was made to the author by Dr. H. S. Carbeth, of Cornell University. Drawing shown.

*A Platinum Air Bath:* CHAS. BASKERVILLE.

A drawing was shown of this bath, used by the designer in atomic weight work, according to the method of G. Krüss.

*Black Rain in North Carolina:* CHAS. BASKERVILLE and H. R. WELLER.

'The famous black rain,' so-called by natives, fell at Louisburg, N. C.

A sample (through the kindness of Professor M. S. Davis, of the Louisburg Female College) came into the hands of the au-

thors, who made an analysis of the water. No especial phenomena were noted preceding or during the precipitation 'except an unusually black cloud and a heavy down-pour of rain, accompanied by a darkness so dense as to necessitate the use of lamps for half an hour.' About sixty per cent. of the total residue (88 parts per million) was organic matter, largely soot. The chlorine content (19.144 parts per million) showed an unusual amount of sodium chloride. The residue contained traces of several metals, as calcium, iron, manganese, zinc and aluminum. The other constituents indicated ordinary rain. The situation and amount of fuel burned in the place, as well as the time of year, preclude accounting for the fluorescent black rain by local contamination such as observed in numerous cases by August Smith and Phipson and lately by Irwin, who examined the snowfall in Manchester (*J. S. C. In.*, 21, 533). While it is well known that unusual impurities in rain, snow, etc., often occur and the sources of contamination may be traced great distances, no opinion is hazarded as to the cause of this phenomenon. All such incidental observations deserve chronicling as did the 'blood rain' reported (by Passerini) to have fallen at Florence in March of last year (*L'Orosi*, 24, 325) and the 'dust fall' in Europe the same month (reported by Hellmann and Meinardus).

C. B. WILLIAMS,  
*Secretary.*

#### BLUE FOX TRAPPING ON THE PRIBILOF ISLANDS.

SCIENCE for January 26, 1900, contained an account of the method of trapping blue foxes employed on St. George Island of the Pribilof group and of the efforts, there and elsewhere, to render the blue fox polygamous by killing males only. Near the end of the article it was said 'The out-

come of these experiments will be awaited with much interest, and if by a little artificial selection and environment a naturally monogamous animal can be rendered polygamous, the supply of blue fox furs will be materially increased.'

The experiment has been continued and, by the courtesy of the Treasury Department, some of the results are here given. From the fact that for the last four seasons all females taken in the traps have been released it might naturally be expected that there should now be a marked preponderance in the number of females. That such is not the case, however, is shown by the fact that during the trapping season of 1900-1901 there were taken 614 males and but 690 females, an excess of only 80 after four years of killing males only. A glance at the subjoined table giving the results of each year's trapping shows that not only has there been no increase in the proportion of females to males, but that in one year the number of males taken actually exceeded that of the females by 89.

#### NUMBER OF FOXES TAKEN ON ST. GEORGE ISLAND.

	Males.	Females.	Total.	Excess of Females.
1897,	102	324	426	222
1898-9,	478	389	867	-89
1899-00,	468	487	955	19
1900-02,	614	690	1304	76

At first sight it might appear that there had been a noteworthy increase in the total number of foxes, but a large portion of this apparent gain is due to the effort that has been made to ascertain the number of foxes on St. George, and in the spring of 1901 trapping was carried on both at the 'fox house' and in other places after the close of the regular season. All these animals were marked and released, so that no fox was counted twice. That there has been some slight gain in the number of foxes seems probable, but a glance at the