

Wilson; Shorter Notices of Braunnühl's 'History of Trigonometry' and of the recent reprint of Carnot's 'Treatise on heat engines' (1824); Notes; New Publications.

The January number of the *Bulletin* contains: Report of the October meeting of the American Mathematical Society, by F. N. Cole; 'Two systems of subgroups of the quaternary abelian group in the general Galois field,' by L. E. Dickson; 'The determination of the constants in the problem of the brachistochrone,' by Oskar Bolza; 'On three types of surfaces of the third order regarded as double surfaces of translation,' by A. S. Gale; 'On the generation of finite from infinitesimal transformations—a correction,' by H. B. Newson; Review of Study's Geometry of dynames, by Virgil Snyder; Review of Weber and Wellstein's *Encyklopädie der Elementar-Mathematik*, by D. E. Smith; Shorter Notices of the mathematical papers of the late George Green, Agnes M. Clerke's problems in Astrophysics, Müller and Presler's Constructive geometry, and Schilling's Catalogue of mathematical models; Notes; New Publications.

SOCIETIES AND ACADEMIES.

THE SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE.

THE fourth regular meeting of the Society for Experimental Biology and Medicine was held in the demonstration room of the department of physiology of Columbia University, at the College of Physicians and Surgeons, on Wednesday evening, December 16. Dr. S. J. Meltzer presided.

Reports of original investigations were offered as follows:

*The Changes in the Viscosity of the Blood Produced by Various Experimental Procedures, with Demonstrations.** R. BURTON-OPITZ.

Dr. Burton-Opitz described and demonstrated the apparatus used in determining the viscosity of the blood. This demonstration was followed by a discussion of the changes in

the molecular friction of the blood after intravenous injections of distilled water, saline, dextrose and alcoholic solutions. The effect of alcohol, when introduced into the stomach and small intestine, was also noted. Next were considered the changes following subcutaneous administration of curare and the differences in the viscosity of arterial and venous blood. K , the coefficient expressing the viscosity was determined before and after each experimental procedure, two or three determinations being made in each case.

It was found that, if distilled water, in quantities of from 5 to 50 c.c., is slowly allowed to flow into the facial vein, the viscosity of the blood is increased, but the increase is not considerable. The following experiment may serve as a sample. The normal coefficient K , in a dog weighing 19.2 kilos, was 802.6, or 5.8 times greater than K for distilled water at 37° C. After the injection of 10 c.c. distilled water the coefficient showed the value 786.0, or 6.0 times greater than distilled water at 37° C. Normal saline solutions produce the reverse effect, *i. e.*, the blood becomes less viscous. In one case after injecting 10 c.c. of 0.7 per cent. NaCl solution, the viscosity of the blood fell from 5.9 to 5.6 times that of distilled water at 37° C. Concentrated solutions of dextrose (5 c.c.) injected into the facial vein bring about an increase in the viscosity of the blood which is more pronounced than that produced by distilled water. About half an hour after the injection the coefficient K shows again its normal value.

If from 3 to 5 c.c. of 10 or 25 per cent. solutions of alcohol in water are allowed to flow into the facial vein, the molecular friction of the blood becomes greater. The same result can be obtained by introducing the alcohol directly into the stomach or duodenum. 30 c.c. of a 25 per cent. solution were injected into the stomach. The viscosity determined twenty minutes later showed the value 608.09, as against 664.17, the normal coefficient. Thus, instead of being only 7.0 times greater than that of distilled water at 37° C., it changed after the injection to 7.7 times greater. An equally decisive change occurred after injecting 40 c.c. of a 25 per cent. solution into the

*The abstracts here given have been prepared by the authors themselves. The secretary has made only a few abbreviations and minor changes.

duodenum. A marked increase in viscosity also follows subcutaneous administration of curare; however, this result is not evident until the respiratory muscles become paralyzed.

Venous blood is slightly more viscous than arterial, but the difference is often very insignificant.

In all these determinations a direct parallelism exists between the viscosity values and the specific gravity. When the viscosity increases the specific gravity increases also, and *vice versa*. Not a single exception to this rule could be found.

The viscosity was also determined in a dog having very large thyroid bodies. The right gland weighed 57, the left 52 grams. The viscosity coefficient, obtained by eight determinations, showed the value 1,233.17 (specific gravity 1.05028), which means that the blood of this animal was only 3.8 times more viscous than distilled water at 37° C. The lowest previous value obtained by Dr. Burton-Opitz occurred in a dog after three days of hunger. *K* equaled in this case 1,110.3 (4.2 times more viscous).

In general it may be said that the less the viscosity the longer the period required for extra-vascular coagulation. This was especially well shown in the case just mentioned. Clotting set in after about fifteen minutes.

Survival of an Animal after Removal of both Suprarenal Capsules, due to a Previous Grafting of the Organ into the Kidney: S. J. MELTZER (for F. C. Busch and Charles van Bergen, of the Department of Physiology at the University of Buffalo).

Dr. Meltzer stated that in several instances survival of a part of suprarenal grafts was obtained after transplantation into the kidney of the same animal.

In one experiment the animal (a rabbit) survived, after apparently all other suprarenal tissue, aside from that which was grafted into the kidney, had been removed. In this case, after total removal of the left suprarenal a part of the gland, including medulla and cortex, was introduced through an incision into the cortex of the left kidney. Eighty-six days later the remaining right suprarenal was removed *in toto*. The animal survived the op-

eration and was apparently normal for twenty-one days, at the end of which time it was killed in order to examine the graft. This was found, upon histologic examination, to have been in part replaced by connective tissue. The surviving cells apparently belong to the medullary portion of the suprarenal. The cortex had been replaced by connective tissue. Blood supply was good.

Slides showing the successful grafts were exhibited under the microscope. In this connection, also, Dr. Meltzer showed, under the microscope, a section of Zuckerkandel's organ, the chromophilic bodies of which are similar in nature to the chromophilic granules of the medullary portion of the suprarenal capsule.

On the Absence of a Cane Sugar Inverting Enzyme in the Stomach: GRAHAM LUSK.

It was shown by Professor Lusk that free hydrochloric acid and not an enzyme caused the inversion of cane sugar in the stomach.

A new Head Holder for Rabbits, with Demonstration: FREDERIC S. LEE.

The following reviews were made:

The Action of Potassium Cyanide upon the Unfertilized Egg: HOLMES C. JACKSON.

Loeb and Lewis were the first to note the fact that unfertilized eggs (of the sea urchin), when placed in $n/1,000$ KCN solution, retain their capability of fertilization much longer than when suspended in normal sea water. This was ascribed to the action of the KCN in inhibiting intracellular autolytic processes which lead normally to maturation and finally death. The bactericidal action of KCN was excluded, as the result of experiments in which eggs apparently died as rapidly in sterile as in putrid sea water.

Gorham and Tower's experiments in the same connection indicated, on the other hand, that the effect of KCN was entirely bactericidal. The sterile eggs retained their capacity for fertilization longer under absolutely sterile conditions than when placed in $n/1,000$ KCN.

As the question now stands there exist two almost identical series of sterilization experiments by two pairs of investigators, with results diametrically opposed to each other. Critically considered, the more carefully con-

ducted experiments seem to be those by Gorham and Tower; and in the lack of further evidence in favor of an intracellular action of KCN in this connection, we must conclude that the destruction of the bacteria by the KCN removes the condition which causes the death of the cell, and in the absence of which the eggs retain their potential power for growth after fertilization.

Results of Recent Investigations in Proteid Chemistry: P. A. LEVENE.

Recent work on the chemistry of the proteid molecule has furnished explanation of many biological phenomena. Thus, in certain pathological conditions there appears in the urine a sulphur and nitrogen-containing substance, cystin. The source of the substance in the organism had been unknown, until through the efforts of Mörner and Embden and others, its radical was demonstrated to be a normal constituent of the proteid molecule.

The chromatin of a developed cell differs from that of an unfertilized egg by the presence in it of radicals of purin bases. It is probable that these bases are derived from the histidin radical, which is also a normal constituent of proteids.

Hemoglobin is known to be absent from the unfertilized egg and it appears only in course of development of the embryo. It was shown recently that the non-proteid part of hemoglobin is a pyrrol derivative and it is probable that a pyrrol radical is present in the proteid molecule. Chlorophyl is also a pyrrol derivative, a fact further establishing its close relationship to hemoglobin.

The work of Emil Fischer points to the way in which the various component radicals may combine in order to form the proteid molecule, and makes probable the eventual synthesis of true proteid material.

New Members.—The gentlemen named below were elected to membership: A. C. Abbott, Isaac Adler, B. H. Buxton, J. McK. Cattell, H. L. Cushing, E. K. Dunham, Simon Flexner, Reid Hunt, Hugo Münsterberg, J. A. Murlin, Horst Oertel, E. L. Opie, Theobald Smith, A. B. Wadsworth, R. S. Woodworth, Naohidé Yatsu.

WILLIAM J. GIES,
Secretary.

THE NEW YORK ACADEMY OF SCIENCES. SECTION OF ANTHROPOLOGY AND PSYCHOLOGY.

THE section met on November 23, in conjunction with the American Ethnological Society. A paper was read by Dr. Clark Wissler, 'Recent Researches on the Decorative Art of the Plains Indians.'

It was demonstrated by specimens and explanations that among the Indians of the plains may be found a type of graphic art that is purely decorative in contrast to a type that is absolutely symbolic. In addition, a transition type occurs in which both the symbolic and the aesthetic motives function. The whole of this art is the work of women. In the purely decorative art complex geometric designs are built up from simple geometrical elements. These elementary designs have technical names and are worked into compositions according to recognized principles and standards. In the symbolic art the designs are conventional representations of objects with sacred or mystic associations and are realistic in motive. While a number of conventional designs are used which are known once to have possessed symbolic value and to have originated in realistic motives, the majority of design elements do not appear to have originated in this way. Their occasional use in a symbolic sense is an afterthought and a makeshift. From which it appears that the graphic art of these Indians, as we find it to-day, is an objective development in contrast to the subjective symbolism of other tribes.

JAMES E. LOUGH,
Secretary.

SECTION OF GEOLOGY AND MINERALOGY.

THE regular meeting of the section took place December 14, 1903, with Professor James F. Kemp in the chair.

The first paper on the program was 'Explorations and First Ascents in the Canadian Rockies,' by Professor Herschel C. Parker.

This paper occupied the evening. It consisted of an illustrated lecture describing the section of the Rocky Mountains in British Columbia and Alberta known as the 'Canadian Alps.'

In a brief introduction an explanation was

given of the physical characteristics that determine the alpine nature of mountain ranges, and it was pointed out that the Rocky Mountains of Canada may justly be termed the 'Switzerland of America.'

A series of more than 100 lantern slides was shown, many of them illustrating six first ascents made by the lecturer. These summits were: Mt. Dawson, the highest peak of the Selkirks; Mt. Goodsir, one of the highest and most difficult peaks in British Columbia; Mt. Lefroy, Mt. Hungable (the 'Chieftain'), Mt. Deltaform and Mt. Biddle, these latter peaks being situated in Alberta near Lake Louise. The summits of some of these mountains were previously thought to be practically inaccessible and the climbs were attended with the very greatest difficulties. Mt. Lefroy was climbed by the lecturer in 1897, Mt. Dawson in 1899 and the remaining four summits during the past season.

The lecturer also briefly described an interesting trip of about 100 miles north of the railroad to Wilcox Pass, where the Saskatchewan and Athabasca Rivers take their rise.

The following two papers were submitted for reading by title and subsequent publication:

Gem Minerals of Southern California: DR. GEORGE F. KUNZ.

In this paper the author said in part that California, especially in its southern portion, had of late years produced the most interesting gem minerals of any state in the union. First came the magnificent series of colored tourmalines, described in recent reports of the Division of Mining and Mineral Resources, U. S. Geological Survey (1899, p. 38; 1900, p. 33; 1901, p. 31); next, the remarkable rose-beryl from Mesa Grande and Pala (*ibid.*, 1900, p. 32), and lastly, the amethystine spodumene (kunzite), in crystals which for purity and beauty of color are unrivaled by any other mineral of North America.*

Thus far the minerals are confined to two counties. The tourmalines occur near San Jacinto, in Riverside County, and at Mesa Grande and Pala, in San Diego; the pink

beryl, in small amounts, at the two last-named localities; and the lilac spodumene at Pala, and also to some extent at Coahuila, in Riverside County, in crystals of similar character but smaller. Other interesting gem minerals are now coming to light in association with the preceding ones. With the spodumenes from Coahuila have been found beautiful beryls, some yellow, closely resembling those from Sarapulka in the Ural Mountains, others pale green and even colorless. Some of the yellow crystals are finely formed, and the others show instances of remarkable etched faces, similar to the crystals from Sarapulka in Perm; while others are almost as delicate as a darning needle. The etching in certain of these is most curious; crystals of three inches long and an inch across, colorless and transparent as the finest rock crystal, are covered all over the prismatic and basal planes with the most complicated etching, and within are hollow, made up of interlocking plates, as it were, exceedingly clear and brilliant.

From Pala came a fine doubly terminated, detached pink beryl which measured 10 cm. by 5 cm., and which was quite transparent and an object of great beauty.

Another mineral recently observed at Coahuila is spessartite (manganese-aluminum garnet), in trapezohedral crystals of remarkable beauty. Some of these are absolutely pure and measure from 6 to 10 mm. in diameter, while large ones are as much as 30 mm., but less perfect. They are implanted upon crystals of albitic feldspar, recalling strongly the occurrence at Amelia Court House, Virginia. The smaller crystals are exceedingly brilliant and beautiful, of a honey-yellow color, deepening to orange-red; others are quite large, but not transparent. The crystalline form is that of the trapezohedron, *n*, in combination with the rhombic dodecahedron, *d*.

Lastly, and of great interest, is the first-noted occurrence in the state of topaz, in distinct and beautiful crystals. The source is the well-known mineral locality three miles from Ramona, in San Diego County. One crystal is absolutely transparent, of a pale blue color, like those from the Ural region, and measures 2 cm. by 1 cm. by 5 mm. The faces

* *Amer. Jour. Science*, Vol. 16, November, 1903; *N. Y. Acad. Sciences*, October 19, 1903.

c and *X* are entirely absent; those present are *p*, *d*, *o*, *f* and *g*, with *m* and *l* of the prism; the pyramid faces are etched. The general character strongly recalls the Alabashka type of the Urals, and this likeness would suggest that the minerals to be found with it will also resemble those of that noted locality. Other crystals are perfectly colorless, but with the same general form and proportions; those of about one centimeter in length are extremely brilliant, the larger ones less so externally, but clear within. It is of great interest that this belt of rare species which traverses the state in its southern portion gives indication of further occurrences of remarkable minerals there to be found.

Clackamas Meteoric Iron: DR. GEORGE F. KUNZ.

There has lately been discovered in Oregon an enormous iron meteorite, ranking with the two immense ones found respectively by Lieutenant Peary in Greenland and by Professor H. A. Ward in Mexico. This is a mass of iron, measuring ten feet in length by seven in width and five in height, pitted in the usual manner, but in an extensive degree, and at one point even perforated, so as to leave an opening through it as large as a man's hand. It was discovered in the autumn of 1902 by a prospector, Mr. Dale, on land belonging to the Oregon Steel and Iron Company, some two miles south of Oregon City, in Clackamas County. The official statement of its location is T. 2, S.; R. 1, E. of Willamette Meridian. It was dug loose from the soil and removed on a truck to adjacent land belonging to Mr. Ellis Hughes, where it now lies, subject to a claim by the company and a suit now in progress. The material has been subjected to analysis by a local chemist and found to contain a small percentage of nickel; but the exact figures are not yet in the author's possession. According to Mr. A. W. Miller, of Portland, Oregon, from whom most of the facts have been learned, a piece which he examined for structure did not show the Widmanstätten figures, but a marked cubical structure, with very high silvery luster. A fine photograph sent by him to the author shows the mass as roughly conical or dome-shaped, on an elliptic

base, wonderfully pitted, and with the hole through its lower portion. Men standing by it indicate its size, which is perhaps as large as that of any other meteorite known.

EDMUND OTIS HOVEY,
Secretary.

MICHIGAN ORNITHOLOGICAL CLUB.

THE last meeting of the Michigan Ornithological Club for the current year was held at the Detroit Museum of Art on December 6. President Adolphe B. Covert presided. There was a good attendance and the papers presented were of much interest. The program was as follows:

NORMAN A. WOOD: 'The Discovery of the Breeding Area of Kirtland's Warbler in Michigan.'

ALEXANDER W. BLAIN, JR.: 'Observations made on the Habits of Birds of the Family Mniotiltidae in Monroe County, Michigan, by Jerome Trombley, during the years 1875-81.'

J. CLAIRE WOOD: 'Some Late Breeders.'

EDWARD ARNOLD: 'Nesting of the Sandhill Crane in Michigan.'

PROFESSOR A. H. GRIFFITH: 'Birds in their Relation to Art.'

Following the papers a business session was held. Dr. J. A. Allen, of the American Museum of Natural History, Wm. Brewster, of Cambridge, and Robert Ridgway, of the Smithsonian Institution, were elected to honorary membership. Many new active members were elected. The constitution was amended so as to allow quarterly instead of monthly meetings. A class of patrons was created.

The next meeting of the club will be held at the Detroit Museum of Art on February 5, 1904. Visiting ornithologists are cordially invited to attend.

ALEXANDER W. BLAIN, JR.
DETROIT COLLEGE OF MEDICINE.

DISCUSSION AND CORRESPONDENCE.

THE WORD BAROMETER.

TO THE EDITOR OF SCIENCE: In my letter of August 28 I expressed the belief that the letter of John Beale to Robert Boyle bearing date February 6, 1665, should read 1666. Since then Dr. J. B. Nichols, of Washington, D. C., has called my attention to the system of