Lehrbuch der Mineralogie. Von MAX BAUER, Zweite, Vollig Neubearbeitete Auflage, 1904. Stuttgart, E. Schweizerbartsche Verlagshandlung (E. Nagele). 1904. Pp. xii, Fig. 670.

A second edition has been issued of Dr. Max Bauer's 'Lehrbuch der Mineralogie,' forming one of the most important works in this department of science that has appeared in the German language. It is printed in large clear type upon good paper, with 670 illustrations, and is exceedingly comprehensive and thorough, not only in dealing with the crystallographic, optical and physical features, but in its account of localities and of new species, which are brought absolutely up to date. Dr. Bauer's position as director of the Mineralogical Institute of Marburg, and his long editorship of the *Jahrbuch für Mineralogie und Geologie,* have given him unusual facilities in the preparation of so important a work, and his well known reputation for thoroughness is an assurance as to its being a complete exposition of the subject. It will form an essential addition to every mineralogical library. G. F. K.

SCIENTIFIC JOURNALS AND ARTICLES.

THE May number of *The Journal of Nervous and Mental Disease* contains the following articles:

'The Central Localization of the Sensory Tract,' by H. H. Hoppe. It contains a full summary of recent anatomical and pathological work on the central localization of sensory functions. 'Two Tumors of the Brain' are reported on by Dr. T. M. McKennan, and Dr. Smith Ely Jelliffe presents a statistical summary of the work of the neurological clinic of Dr. M. Allen Starr for 1903. He shows that in 16 years 31,600 patients have been treated for nervous disease and that about 4 per cent. of all diseases are of the nervous system. 'Two Cases of Meningeal Tumor' are described by Dr. A. C. Brush. These were treated by ligature of the meningeal vessels. 'The Influence of Fever in the Pain of Locomotor Ataxia' is discussed by Dr. C. W. Burr. This number also contains accounts of the meetings of the Philadelphia and New York Neurological Societies, and its regular series of abstracts from the leading neurological journals, *Revue Neurologique, Neurologisches Centralblatt, Deutsche Zeitschrift für Nervenheilkunde, Monatschrift für Psychiatrie und Neurologie* and *Jahrbücher für Psychiatrie und Neurologie* being noted in this number.

CONTENTS of the *Journal of Comparative Neurology and Psychology* for April:

O. P. JENKINS and A. J. CARLSON: 'Physiological Evidence of the Fluidity of the Conducting Substance in the Pedal Nerves of the Slug, *Ariolimax columbianus.*'

C. W. PRENTISS: 'The Nervous Structures in the Palate of the Frog: The Peripheral Networks and the Nature of their Cells and Fibers.'

C. L. HERRICK: 'The Beginnings of Social Reaction in Man and Lower Animals.'

ROBERT M. YERKES: 'Inhibition and Reinforcement of Reaction in the Frog, *Rana clamitans.*'

RAYMOND PEARL: 'On the Behavior and Reactions of *Limulus* in Early Stages of its Development.'

Editorial.

G. E. COGHILL: A Critical Digest of Recent Studies on the Finer Structures of the Nerve Cell.

Literary Notices.

SOCIETIES AND ACADEMIES.

THE BOTANICAL SOCIETY OF WASHINGTON.

THE April meeting of the society was held Saturday evening, April 23, at the Portner Hotel. Mr. David G. Fairchild acted as chairman of the program. After the regular review of literature Dr. George T. Moore, of the Department of Agriculture, spoke on the subject, 'A Method for the Destruction of Algæ and Pathogenic Bacteria in Water Supplies.' The speaker mentioned briefly the history of some of the serious difficulties that have been experienced by the water departments of many cities as a result of contamination of the reservoirs by algæ of one sort or another. He said that he had received numerous complaints from each state of the union, showing that the trouble is general. Its seriousness in many cases is shown by the fact that controlling engineers have in some cases recommended that supplies representing an investment of several million dollars be

abandoned, simply on account of the continued trouble from algæ. The direct result of the presence of algæ in serious cases is that the water acquires a very disagreeable odor and taste which may resemble that of decaying wood or has what is described as a 'fishy' smell and taste. Often this odor and this taste are not due to the decomposition of the plants but are caused by small drops of oil secreted by certain of the algæ.

Up to the present time no practicable remedy has been found for this trouble which is capable of general application. Double filtration, covering the reservoir, the removal of all organic matter and similar expedients have all been tried, and in some cases proved nearly or quite efficient, but such means are usually too expensive or for some other reason are impracticable. It has been shown by experiment, however, that it is quite feasible to treat infected reservoirs with copper sulphate in such quantities as to give a solution varying from one part in a million down to one part in 500 million. The former strength is not considered harmful even as a constant beverage, and the latter dilution appears to be effective in disposing of most algæ under ordinary conditions. In water containing any appreciable amount of lime or organic matter, the copper is soon precipitated out, so that the danger of harmful overdosing is still further prevented.

The speaker deprecated the extravagant statements that have recently been made in the daily papers regarding the efficacy of this copper treatment in ridding water supplies of certain pathogenic bacteria, such as the germs of typhoid and cholera. In his opinion the present indications are that where no other remedies can be applied to prevent or remove bacterial infection this may be accomplished by treatment with copper. It is in no way designed to replace slow sand or other effective filtration methods now in use, but it is believed may be of some service where such systems are not installed.

Mr. L. L. Harter, of the Department of Agriculture, then spoke on the subject, 'Varietal Differences in Resistance to Toxic Salts.' The speaker outlined some experiments that he has recently undertaken with a view of determining whether or not varieties of the same species differ in their resistance to toxic salt solution. He has conducted the work with wheat varieties obtained from various sources and which show great diversity of climatic and soil conditions.

He found that it required a solution of sodium carbonate three times as concentrated to kill a Kansas or Russian variety as it did one from Michigan. The limits in sodium chloride varied from .045 to .055 of a normal solution, and of sodium bicarbonate from .025 to .03. He further showed that the Michigan and Russian varieties are two and one half and two times respectively more resistant in magnesium chloride than one obtained from Turkestan. Almost as great a variation was obtained with the Michigan and Kansas varieties over the one from Turkestan, requiring in both cases twice the concentration of magnesium sulphate to kill the root tips.

Carl S. Scofield,
Recording Secretary.

THE TORREY BOTANICAL CLUB.

The meeting of Tuesday, March 8, 1904, was held at the College of Pharmacy, with Vice-president Rusby in the chair; there were seventeen persons present. The minutes of the preceding meeting were read and approved.

The first paper on the scientific program was by Professor Francis E. Lloyd on 'Recent Investigations on the Pollen-tube,' and was an interesting exposition of the parallel results of Longo's investigations on the behavior of the pollen-tube in Cucurbitaceæ and Professor Lloyd's work on Rubiaceæ.

Longo finds that in *Cucurbita Pepo* L., the ovary is provided with a special conductive tissue reaching to the neck of the flask-shaped nucellus by means of which the pollen-tube follows a completely intercellular course from stigma to embryo-sac. In other species of *Cucurbita* and in *Citrullus vulgaris* the neck of the nucellus is not long enough to reach to the conductive tissue, so that for a short distance the tube must move through a cavity. On reaching the neck of the nucellus, the pollen-tube forms a bulla that produces lateral outgrowths which Longo believes are for the

purpose of reaching out after food materials, as their size seems to depend on the amount of starch present. This view is rendered somewhat questionable by the phenomena observed by Wylie in *Elodea*, where pollen-tubes may produce similar 'cystoids' in the free space of the locule, but never produce them in the tissues where food substances must be more abundant.

Longo supports his conclusion that the intercellular course of the pollen-tube is followed not because of inability to grow in open space, by showing that pollen-tubes may be produced in moist air from such normally endotropic forms as *Humulus Lupulus* L., *Picea excelsa*, etc. He interprets chalazogamy as a physiological fact having bearing on phylogeny. In plants having endotropic pollen-tubes, he considers the direction of their growth to be determined chemotactically.

The main points in Professor Lloyd's independent conclusions from work on Rubiaceæ are: (1) The form of cells in the conductive tissue does not determine the course of the pollen-tube, for in *Richardsonia* and *Diodia teres* the cells are elongated at right angles to the path of the tube. He believes the chemotactic stimulus which determines the direction to be differentially distributed from the egg cell. (2) The ectotropic or endotropic behavior of the pollen-tube is a physiological character.

The second paper of the evening, by Mr. Edward W. Berry, was entitled 'Some Monotypic Genera of the Eastern United States and their Ancestors.' The phylogeny of *Liriodendron* was briefly sketched from its first appearance as a narrow simple-leaved form in the mid-Cretaceous of the Atlantic coastal plain, its spread to Europe and Asia, its development into large lobate leaved forms, and its final extinction except for the existing species of eastern North America and a waning variety in eastern Asia. Drawings of all the fossil species were shown, and numerous blue-prints of the leaves of the existing species, showing their parallelism and range of variation.

Sassafras was the second genus considered. It was pointed out that while the described fossil species were numerous, many of them are not allied to *Sassafras*. The species which were considered as positively identified were discussed, as well as the peculiar characters of the leaves of the existing species, both ancient and modern forms being abundantly illustrated.

The third genus discussed was *Comptonia*. Its former range and development were described and drawings of a number of the species were shown.

All three genera were considered to have taken their origin from simple-leaved ancestors which flourished during the closing days of the lower cretaceous, and to have originated in America, becoming dominant and widespread in pre-glacial times, finally becoming restricted to their present habitats chiefly through the agency of the glacial conditions of the Pleistocene period.

The paper was discussed by Professors Rusby, Underwood and Lloyd and Dr. Howe.

TRACY E. HAZEN,
Secretary pro tem.

THE NEW YORK ACADEMY OF SCIENCES.

SECTION OF ASTRONOMY, PHYSICS AND CHEMISTRY.

THE regular meeting of the section was held on April 4, at the American Museum of Natural History. The program consisted of three papers, abstracts of which are as follows:

The Variation of Latitude at New York City: Part 2, Variation of Latitude and Constant of Aberration: J. K. REES, HAROLD JACOBY and HERMAN S. DAVIS.

The results of seven years' continuous observations for a study of latitude variation and the aberration of light are contained in the present paper, which will appear as the second and last part of Vol. 1, in the academy's series of *Memoirs*. To that publication the reader is referred for complete details and results; it is not possible here to do more than mention very briefly the plan of the work, and to state the fact of its completion.

The simultaneous and continuous observation of the same stars at stations situated on a single parallel of latitude, but separated widely in longitude, has long been recognized as the best method of attacking the problem

under consideration; the first actual practical application of the method is the one treated in the present paper. The other participating observatory is the one at Capodimonte, near Naples, where simultaneous observations were made by Professor Fergola and his associates.

The New York and Naples work was continued until a similar, but a more elaborate, plan was put in operation by the International Geodetic Association, which includes all civilized governments. This plan involved the establishment of four suitable special latitude stations, and rendered further work at New York and Naples unnecessary.

Energy Liberated by Thorium: George B. Pegram and Harold W. Webb.

The method used in this investigation of the energy liberated by thorium due to its radioactivity was to measure the difference between the temperature of three kilograms of thorium oxide, enclosed in a Dewar bulb, and that of a surrounding ice-bath, by means of a set of iron-constantin thermo-electric couples. Uniformity of temperature in the bath was secured by means of a rotating stirrer and careful heat insulation. The thorium oxide was cooled, so that its initial temperature was below that of the surrounding bath. Readings were taken at frequent intervals, and after several days the difference of temperature became constant, with the oxide .04° warmer than the bath. Several such series of observations were made. From the rate of change of temperature and from an approximate calculation of the heat capacity of bulb and oxide, a tentative value of the heat liberated was found; 8×10^{-5} gram-calories per gram of thorium oxide per hour (.93 ergs per gram per second), or 9×10^{-5} gram-calories per gram of pure thorium per hour. Further investigation is being made to determine these values more accurately.

Note on a Tribophosphoroscope, and the Duration and Spectrum of Tribophosphorescent Light: Wallace Goold Levison.

Discs of thick pasteboard about 15 cm. in diameter are evenly sanded on one or both sides on a coating of liquid glue with the materials to be examined in powder, narrow bands being sufficient and only small quantities of the materials required.

The disc selected is then rotated at a known and usually moderate speed (twelve revolutions per second, for example) by any convenient mechanism, such as an ordinary rotator used for illustrating the recomposition of light.

A point or brush of wire or other material, or a piece of the same material with which the disc is coated, being pressed against the sanded surface, produces a trail of light which extends from the point of contact in an arc more or less around the disc; varying in color with different materials and in length with the speed, and is maintained for some time unless the material is rubbed off by extreme friction. A grindstone or corundum wheel may often be used to advantage with hard substances as a substitute for the disc, since a specimen held against it soon coats it with a trace of the material which shows its luminous trail beautifully.

By means of the device described the intensity of the light may be determined with a photometer, its duration from the length of the trail, and its spectrum delineated with a spectroscope.

The following approximate, tentative results of the examination of a few minerals are given to illustrate its applicability.

1. Sphalerite (1) from Utah. Light yellow concretions in gray massive sphalerite. Visible trails are produced of respectively increasing brilliancy and length with the tip of the finger; a wooden match; the finger nail; a brass wire brush; and a steel wire brush, or point; of a yellow orange color, visible, with the latter, at a distance of several yards and extending about one quarter around the disc at the above speed. Hence, the duration is about 0.02 s. The spectrum is short, extending from about the line *C* to the line *E* and embracing some red, orange, yellow, yellow-green and green. (2) From another locality very similar to the above in character, and afforded like results. (3) Of several dark colored sphalerites some showed a little light

at the point of contact of the brush, but no trail.

2. Quartz. (Sandpaper disc or grindstone.) No light from brushes (except incandescent sparks from hard steel). A piece of quartz, however, gives a bright yellow light, and if of rock crystal is luminous within by internal reflection. Very short trail and duration.

3. Corundum. (Emery paper disc or corundum wheel.) No light from brushes (except as above). A piece of ruby or ruby corundum against the corundum wheel or a grindstone evokes a brilliant crimson light and short trail and is luminous within by internal reflection. Duration about 0.005 s.; a piece of emery against a corundum wheel gives a like trail but is not itself luminous.

4. Pectolite, Woodcliff, N. J. Wire brush. Light greenish-blue trail only medium bright but extending completely around the disc. Duration over 0.08 s.

5. Limestone, Hellfire Rock, Utah. Feeble greenish-blue but similarly long trail. Duration over 0.08 s.

6. Willemite. (1) Hard yellow-green gem material, Franklin, N. J. Short greenish-yellow trail. Duration very short. (2) Opaque, massive green variety. Feeble short green trail. Duration about 0.02 s. Best obtained with a spectrum pressed against a corundum wheel or grindstone. Various specimens give somewhat different effects. (3) Pink or brown variety. Longer and brighter green trail. Duration about 0.03 s.

7. Chlorophane. (1) Violet from Trumbull, Conn. Bright green and very long trail; best obtained by friction of a specimen against a grindstone or corundum wheel or a disc coated with the same material. Duration over 0.40 s. Spectrum broad band in the yellow-green and green. (2) Green from Amelia Co. Courthouse, Va. Trail similar but brighter; spectrum similar. (3) Red from Haddan Neck, Conn. Trail similar.

In the discussion of the paper that followed Dr. George F. Kunz stated that Professor Baskerville and himself had under examination a zinc-blende from Utah, the natural mineral varying in color from yellow to fawn and to pale brown. This was the most intense tribo-luminescent substance that they had yet investigated. Two bits one fourth the size of a pea, if pressed together lightly with the fingers, caused a brilliant yellow green light to glow as long as the pressure lasted; and it also possessed the property of becoming radio-responsive to the beta and gamma rays of radium; that it was the first natural zinc-blende they had examined that showed this remarkable property.

Mr. W. J. Hammer showed a sample of artificial blende made by Mr. W. S. Andrews, of Schenectady, N. Y., which gave very strong tribo-luminescence.

C. C. TROWBRIDGE,
Secretary.

THE ACADEMY OF SCIENCE AND ART OF PITTSBURG. SECTION OF BIOLOGY.

THE regular monthly meeting of the section was held on February 2 in the lecture hall of the Carnegie Institute. Three topics were presented. The first paper was offered by Mr. W. E. Clyde Todd, on 'The Birds of Erie and Presque Isle, Erie County, Pa.' This paper is based on his personal observations during the season of 1900, supplemented by extensive field notes made by local observers, and published records.

The locality in question is considered by the author as the most favorable in the entire state for the study of water-birds. Two hundred and thirty-seven species are recorded. A full account is given of the physical features and climatic conditions of the lake shore plain, and after a careful study of the avifauna of the region Mr. Todd reaches the conclusion that it should be included in the Alleghenian fauna.

Dr. A. E. Ortmann followed with a paper on 'The Cosmopolitan Character of the Deep-Sea Fauna,' stating that a small collection of deep-sea schizopods from the Hawaiian Islands, recently received at the Carnegie Museum, has furnished a few new cases which show very wide horizontal distribution. Species found hitherto only in the Atlantic Ocean are recorded for the first time from the Pacific, a circumstance which strongly suggests their

cosmopolitan distribution. This fact is not, however, a new discovery, as similar cases have been observed before, but it is considered worth while to carefully record all these cases, since it has been doubted whether a world-wide distribution is a prominent characteristic of the deep-sea fauna.

Although it is not contended that there are not cases of a more restricted distribution among abysmal animals, yet we must recognize cosmopolitan distribution as a remarkable feature of the deep-sea fauna, inasmuch as we have a very good explanation of this condition of affairs, in the fact that climatic differences are not present in the deep sea, as its temperature is uniformly cold.

Frederic S. Webster closed the meeting with his topic 'The Smallest Carnivore,' exhibiting four of the seven known specimens of this rare and diminutive weasel, *Putorius allegheniensis*. One of the mounted specimens was taken but a few days before the meeting of the section, and is very interesting, as it proved to be an adult male, and the first one of this sex secured. It is beautifully dressed in a dense winter coat of clear unstained white, excepting a few rather pale brownish markings on the crown and occipital region, and a very narrow dorsal line, about the length of the sacrum, and another small spot on the heel of the right leg. A few dark brownish hairs tip the short delicate tail.

Three important features were pointed out, *i. e.*, that the well-known disproportion in size existing between the sexes of other species of weasels is not a marked characteristic of this little-known species, nor does the indistinct brown of the tail seem to indicate that this member is furnished with the usual black of the other species.

Another interesting feature is noticeable in the dentition, and as this peculiarity is present in three of the specimens (the fourth specimen has the incisors of the mandible injured) we are inclined to believe that it is a constant feature of this species.

In all the skulls of *Putorius noveboracensis* in the collections of the Carnegie Museum the mandibular incisors are placed more or less in a continuous line, and can be readily counted when the jaws are closed, but in *Putorius allegheniensis* the second incisors are posterior, being placed *quite* back of the first, and third, and are consequently neatly hidden away behind these teeth when the jaws are closed, giving the impression that there are but four incisors present in the mandible instead of six.

A second specimen, also mounted, is in winter coat, but considerable brown is spread here and there over the dorsal region. But little brown or black tips the tail.

A third specimen was that of a mimmied animal in summer pelage. The throat and chest are irregularly marked with white; the abdomen has the same uniform brown of the back.

The fourth specimen (a skin) had considerable white on the under parts; but is not evenly distributed.

It would not be surprising if, when a specimen in full summer pelage is obtained, we should find that this species differs from the other weasels in wearing throughout a uniform coat of brown in summer.

Six of the seven specimens taken have been found in Pennsylvania. The male specimen was caught at Pravo, Jefferson County, Ohio, in a box trap, by a country lad, and he, thinking it a common 'varmint,' promptly despatched it by placing the trap in a trout stream.

Frederic S. Webster,
Secretary-Treasurer.

THE SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE.

The sixth regular meeting of the Society for Experimental Biology and Medicine was held on the evening of April 20, in the bacteriological laboratory of the department of pathology of Columbia University, at the College of Physicians and Surgeons. Dr. S. J. Meltzer presided.

Members Present.—Burton-Opitz, Calkins, Gies, Hiss, Hunt, Jackson, Lee, Levene, Lusk, Meltzer, Murlin, Norris, Park, Richards, Wadsworth, Wallace, Wilson, Yatsu.

Members Elected.—J. J. Abel, E. G. Conklin, A. R. Cushny, C. B. Davenport, W. H.

Howell, L. B. Mendel, T. H. Morgan, F. G. Novy, W. T. Porter, L. B. Stookey, W. H. Welch.

Constitutional Amendment.—The following amendment was added to the constitution by unanimous vote: "Each non-resident member shall be required to present in person, at least once every two years, a communication containing the results of an *experimental* investigation, or to send to the president, within that time, such a communication for presentation at a regular meeting of the society."

Eligibility to Membership.—Many inquiries regarding admission to membership in the society have recently been addressed to the secretary. It seems desirable to state publicly that only *active investigators* in biology or medicine are eligible to membership. The constitution of the society provides for *automatic forfeiture of membership* by any member who may cease to be an 'active investigator, *by experimental methods,* in biology or medicine.' Visitors are welcomed to the meetings.

Abstracts of reports of original investigations:*

On the Secretion of Human Bile: P. A. LEVENE, W. G. MELVIN and B. MICHAILOWSKI.

The bile was obtained from a patient with a biliary fistula. The patient had been operated upon for gall stones, and was in comparatively good health at the time of the experiment.

Diet and Dosage.	Volume—24 hrs., c.c.	Total Solids, %.	Organic Matter, %.	Ash %.
Mixed diet	780	1.57	0.76	0.82
Animal diet	785	1.68	0.60	1.08
Milk diet	845	1.61	0.56	1.05
Vegetable diet	835	1.64	0.80	0.84
Sodium carbonate	461	1.62	0.71	0.92
Hydrochloric acid	461	1.53	1.08	0.45
Calcium chloride	687	1.63	0.56	1.08
Sodium salicylate	642	1.40	0.42	0.98
Methylene blue	864	1.58	0.54	1.04

Attention was directed to (1) the influence of diet on the quantity of bile secreted per twenty-four hours, (2) the permeability of the biliary ducts for certain substances like methylene blue and sodium salicylate, (3) the influence of these substances and of some salts and acids on the secretion, and (4) on the nature of the so-called 'bile mucin.'

The quantities of bile secreted under different conditions, together with other data, are briefly summarized above.

For methylene blue and sodium salicylate the bile ducts proved less permeable than the kidneys. There was observed a marked increase in secretion after subcutaneous injections of methylene blue. The 'mucin' was found to be a phosphorized proteid, but no purin bases could be detected in its molecule.

Experiments with Certain Nitriles and their Antidotes: REID HUNT.

Experiments (carried out in the laboratory of Professor Ehrlich) on the toxicity of a number of nitriles, and the antidotal action of certain sulphur compounds towards them, were described. Most of the nitriles studied are poisonous in virtue of the HCN which is split off in the body; in the case of some of the nitriles of the aromatic series and of certain amino nitriles, the molecules themselves seem to be poisonous. Although each of nearly all of the compounds studied is capable of splitting off one molecule of HCN, it was found that the toxicity of the various compounds differed greatly. The toxicity depends in general upon the ease with which the HCN is split off; in some cases this seems to bear a relation to the ease with which the residue united to the CN group is oxidized in the body. Benzonitrile, containing the group C_6H_5, which is oxidized with difficulty in the body, is scarcely more poisonous than phenol. Acetonitrile, also containing a group, CH_3, which is oxidized with difficulty, is also but slightly toxic. Propionitrile and formaldehydecyanhydrin, which contain easily oxidizable groups, C_2H_5 and CH_2OH, are very poisonous.

The toxicity of the molecules of a few nitriles is greater than that of HCN itself, although the latter was the only toxic agent involved. Thus, the molecule of chloralcyanhydrin, $CCl_3CH(OH)CN$, is nearly twice as toxic as that of HCN. The probable explanation of this is that the chloral residue with

* The authors of the reports have furnished the abstracts. The secretary has made only a few abbreviations and minor alterations in them.

which the CN is in combination causes this compound to be distributed especially to the central nervous system; the HCN is thus split off in greater concentration in these important organs than is the case after the administration of a compound which is distributed more uniformly to important and unimportant organs. Through the application of this principle it may be possible to modify the distribution in the body of a remedial agent, so that the active principle may be present in especially great concentration in the organs which it is desired to affect. It was suggested that the powerful action of nitroglycerine upon the blood vessels may be explained on a similar hypothesis. The view of Hay, that the dilatation of the blood vessels caused by nitroglycerine is due to the formation in the organism of nitrites from this body has been generally accepted, although the objection has been made that it requires two hundred times more sodium nitrite than nitroglycerine to produce a given effect. This criticism may be met by the hypothesis that the glycerine residue of the nitroglycerine causes this compound to be distributed especially to the arterial walls, so that the nitrite will be formed in greatest concentration at the point where it exerts its action.

The work of Heymans and Masoin on the antagonistic action of sodium thiosulphate towards certain nitriles was extended to many new cyanogen compounds. In addition to the thiosulphate, several other compounds, containing a sulphur atom which is easily split off, were tested (the sulphur unites in the body to form a little poisonous sulphocyanate). The most efficient of these new sulphur compounds were thialdin, carbothialdin and potassium xanthogenate. Great differences in the extent of the antidotal action of these bodies towards the various nitriles were noted. Thus, thialdin protected against nitriles towards which potassium xanthogenate was without action; towards other nitriles potassium xanthogenate was the more efficacious. Many of these differences can be easily explained on the hypothesis that the various nitriles and sulphur compounds are differently distributed in the body. Unless both the sulphur compound and the nitrile reach the same cells, and unless the conditions in these cells are favorable for the formation of the sulphocyanate, no neutralization will take place.

Especially interesting are the experiments on the antidotal action of alcohol towards certain nitriles. It was found that small doses of alcohol protected an animal against three to five times the fatal dose of acetonitrile and formaldehydecyanhydrin, and that after otherwise fatal doses of these substances, the animal recovered if small doses of alcohol were given. It was suggested that the explanation for this action may be that, because it is easily oxidized, alcohol consumed the oxygen usually available for the oxidation of the CH_3 and CH_2OH groups of these compounds, and for the consequent liberation of the HCN. Support for this hypothesis was found in the fact that dextrose (another easily oxidizable substance) also protects against acetonitrile.

This seems to be the first case in which alcohol has been clearly shown to have an antidotal action toward a poison. It was suggested that alcohol may have an analogous action in certain pathological conditions in which physicians have long claimed a beneficial result from its use. Toward HCN itself and several other nitriles, alcohol has no antidotal action; in fact, in some cases the toxicity of the nitrile was increased by it.

Toxicity of Certain Quinine Derivatives: Reid Hunt.

In one of the side chains of the quinine molecule there is, according to the commonly accepted view, a vinyl group, $-CH=CH_2$. As the toxicity of many compounds (*e. g.*, neurine and allyl alcohol) is chiefly due to the presence of such a group, experiments were made (in Professor Ehrlich's laboratory) to determine whether this is the case with quinine. A number of derivatives in which the vinyl union was broken by the addition of H (hydroquinine), or of O or OH (oxyhydroquinine), or of H and Cl (hydrochlorquinine), were tested as to their toxicity upon various mammals and certain infusoria. The experiments showed that the presence of the vinyl group in quinine is without special significance as far as toxicity is concerned, the first two of

the new compounds being about as poisonous as quinine itself. The results of the experiments with hydrochlorquinine are of special interest; these showed that the addition of H and Cl decreases the toxicity for mammals while increasing it for infusoria. Thus the amount of hydrochlorquinine required to kill mice was two and a half times as much as that of quinine, while the former substance is distinctly more poisonous to certain infusoria than the latter. It is possible that hydrochlorquinine (or similar compounds) will be found to be more effective than quinine, in the treatment of malaria, and further work along these lines may result in the discovery of quinine derivatives which will be of value in certain diseases, caused by protozoa, in which quinine is of little value. Further experiments are in progress.

Report on the Metabolism of a Case of Diabetes Mellitus: A. R. MANDEL and GRAHAM LUSK.

The case was a young man whose urine contained no albumin, little ammonia, only a small amount of acetone and no β-oxybutyric acid. All these symptoms are said to justify a favorable prognosis. The patient was put on three different diets for three successive periods: Diet I.—Rich cream, oatmeal, meat, eggs, butter; Diet II.—Same as I., with 100 grams of levulose; Diet III.—Rich cream, meat and eggs. The oatmeal was used on account of the favorable results obtained by Von Noorden.

Diet III. was practically a meat-fat diet. Upon this diet the polyuria decreased and the sugar fell from 8 to 4 per cent., both of which phenomena would be favorably interpreted by the clinician. But on calculating the ratio between sugar and nitrogen in the urine (after deducting the sugar fed in the cream) the relation between the two was found to be 3.65 grams of dextrose to 1 gram of nitrogen, as follows:

1904.	Dextrose, grams.	Nitrogen, grams.	D:N.
March 2.....	82.7	23.0	3.60:1
3.....	87.1	23.8	3.65:1
4.....	100.7	27.5	3.66:1

It will be noticed that the sugar and nitrogen rise and fall together. The amount of fat fed varied, but did not affect the ratio. The sugar production is therefore parallel to the proteid metabolism. Since 1 gram of urinary nitrogen represents the destruction of 6.25 grams of proteid, we can calculate the sugar production from proteid. This D:N ratio is the same as that obtained in our laboratory in phlorhizinized dogs. It has also been obtained by others in the human subject, but has been falsely interpreted as indicating the production of sugar from fat. It represents the maximum output of sugar from proteid and a complete intolerance for carbohydrate. It is probably the most grievous prognostic sign in diabetes.

A calculation shows that the carbohydrates in the oatmeal and levulose were nearly quantitatively eliminated in the urine when the patient was under the influence of Diets I. and II.

The patient rapidly lost in weight and died in coma five weeks after the completion of the above investigation.

Antihæmolytic Properties of the Serum of Nephrectomized Rabbits: S. J. MELTZER and WILLIAM SALANT.

In studying the properties of the blood of nephrectomized rabbits it was found that bullock's serum, which is distinctly hæmolytic, for normal rabbit's blood, was less so for the red cells of nephrectomized rabbits. It was found, further, that the serum of nephrectomized rabbits contains a distinct antihæmolytic element which is destroyed by heating for an hour at 58° C. On the other hand, the 'washed' red cells of nephrectomized rabbit's blood are at least no more resistant to the hæmolytic influence of bullock's serum than the red cells of normal rabbit's blood.

On the Influence of Suprarenal Extract upon Absorption and Elimination, with Demonstration: S. J. MELTZER and JOHN AUER.

In a series of experiments it was found that a previous intravenous injection of adrenalin will make a rabbit resistant to a surely fatal dose of strychnine. (Such an experiment was demonstrated to the society.) In experiments with subcutaneous injections of fluorescein it was also found that in the animal which had previously received injections of adrenalin the

greenish yellow color of the conjunctiva, mucous membranes and skin appeared much later than in the control animal. Both results might be due to delayed absorption or delayed transudation, or to both. In further studies with subcutaneous injections of fluorescein it was found that the color entered the blood later, and in diminished quantity, in the adrenalin animal than in the control. Among other observations, it was noted that the kidneys of the control animal were more intensely colored than those of the adrenalin animal. The same difference was found when equal quantities of the stain were injected directly into the blood stream. The lesser coloration of the kidney is therefore due to the diminished elimination by the kidneys in the adrenalin-animal. Other related problems are still under consideration. But the reported series of experiments already justify the conclusions that suprarenal extract delays absorption as well as elimination.

The starting point for the investigation was the hypothesis, stated by Dr. Meltzer in another publication, that since capillary endothelia possess irritability and contractility, their pores are surrounded by rings of contractile protoplasm which act like sphincters upon them, thus increasing and decreasing the permeability of the endothelia. The explanation for the observed facts is now offered that suprarenal extract, which causes contraction of the smooth muscle fibers of the arterioles, causes, also, an increase of the contractility of the endothelia, diminishing thereby their permeability and thus reducing their powers of absorption and elimination.

Mendel's Law. E. B. Wilson.

A review of the more important facts in Mendel's observations, together with a statement of some of the deductions to be drawn from them.

William J. Gies,
Secretary.

SCIENCE CLUB, UNIVERSITY OF WISCONSIN.

The seventh meeting of the club for the year 1903–04 was held in the physical lecture room of Science Hall, April 26.

The first paper, by N. M. Fenneman, on 'The Arapahoe Glacier in Colorado' was a description of some recent explorations by the author and investigation of the character of the Arapahoe Glacier. This glacier lies about twenty miles west of Boulder, Colorado, and is about a half mile long and about a half mile wide. It has been only recently that the glacier has been studied scientifically. The glacier follows the type of the North American glaciers.

The second paper, by W. D. Frost, on 'The Antagonism of Certain Saprophytic Bacteria against the Typhoid Bacillus' developed the facts that four very common bacteria produce substances that kill the typhoid germ; that these substances are heat stable but that their efficiency varies directly as the temperature; and that they are alkaline and are neutralized by acids. Mr. Frost's experiments have shown that at the temperature of the ice-chest these substances do not kill the typhoid germs and hence is explained the prevalence of the most severe epidemics of typhoid in winter.

After the foregoing papers were read and discussed the club proceeded to elect the following officers for 1904–5:

President—H. L. Russell.
Vice-President—A. Trowbridge.
Secretary-Treasurer—F. W. Woll.

Victor Lenher,
Secretary.

DISCUSSION AND CORRESPONDENCE.

SHALL WE HAVE TWO GRADES OF COLLEGE PHYSICS?

The writer has examined about twenty catalogues of institutions where technical courses in engineering exist side by side with courses which may be termed general or cultural. Of these only five made any distinction in the manner in which the subject of physics was presented to students in their various departments. Doubtless a more extended investigation of the subject would reveal others, but it is probable that the ratio would not be greatly changed.

I wish in this note to raise the question whether it is not wise to give two courses in general physics in such institutions as have been referred to, the one being adapted to en-