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THE BULLETIN

The Bulletin has begun the new year with high hopes. Its beginnings have been modest, but it prefers a sure if rather slow growth to a meteoric but brief career. It can now boast of a well organized printing staff composed of several generous Woodstock theologians. They have been professors of science and realize the benefits of a review of this kind to those now engaged in the teaching in our schools, and so they are willing to give of their time and labor to make it a success. They are now clamoring for copy to feed the presses, and so the Bulletin again asks its readers to send in short articles, notes or references of special interest to Ours engaged in teaching or studying the various sciences. Nor does it forget those who have done good work in the class room and laboratory and a re now devoting themselves to the Queen of the Sciences in preparation for ordination. While it realizes that they are still interested in their former work, it hopes also that they will give their successors the benefit of their experience in its pages. Those particularly who are now in foreign lands can enlighten us regarding methods, texts etc, requirements of Our colleges outside the United States. The Bulletin of course is for curselves and hence it makes no attempts to compete with the standard scientific journals. Some of these come to our college libraries, but they are so numerous and voluminous now that it is impossible to see them all regularly. Thus it is easy to overlook important and interesting articles unless one's attention is called to them. The Bulletin will be glad to receive notice of such articles. References and brief abstracts of articles from foreign journals will be much appreciated. Articles for the Bulletin may be sent to Fr. H. M. Brock, Woodstock College, Woodstock, Md.

AMERICAN ASSOCIATION MEETING:

A fair number of Ours attended the Christman Meeting of the American Association for the Advancement of Science, and its affiliated societies in Cincinnati, beginning Dec. 27th. They enjoyed the gracious hospitality of the fathers at St. Xavier's College at Avondale and St. Xavier's High School at 7th and Sycamore Sts. The sessions were held at the University of Cincinnati and at the Hughes High School in the upper part of the city. Dr. Charles D. Walcott, Secretary of the Smithsonian Institution and an eminent paleontologist presided. And Dr. J. P. McMurrich, the retiring president read the Presidential Address, "A Retrospect," which in view of the fact that this was the 75th anniversary of the association was largely historical. One general session was devoted to the history of the association with addresses by some of the oldest surviving ex-presidents. Since the association was founded many other flourishing scientific societies have come into existence in this country. Most of these are affiliated with the association and meet with it. In recent years, nearly all of the papers have been presented at the sessions of these societies with an occasional joint meeting with the corresponding

section of the association. This is perhaps inevitable. The latter is now a sort of patron under whose auspices students and exponents of the different sciences meet. It arranges all the details of the general meetings and has a few public sessions but leaves each science practically to its own society. This means that many sessions are going on at the same time and only a limited number of papers can be heard.

The most interesting public session at Cincinnati was that at which Dr. W. R. Whitney of the Research Laboratory of the General Electric Company at Schenectady, gave an illustrated lecture entitled the "Vacuum - There's something in it." The lecturer who has gained his training in exposition as instructor and professor of Theoretical Chemistry for a number of years at the Massachusetts Institue of Technology, discussed in a vivid way the properties of vacuum tubes and in particular those of the three electrode type. A number of experiments were shown which held the interest of the large audience. Thus by using amplifiers, it was possible to put on a good sized Mazda Lamp by flashing a bright light on a photoelectric cell and also by bringing up a charged glass rod to a conductor connected to the grid of a tube. Instead of using an electroscope in the usual way to demonstrate the ionizing power of the X-ray, three toy baloons were employed suspended by three threads from a common point. The lecturer and his assistant electrified these by rubbing them vigorously over their heads. The baloons repelled each other but quickly came together when X-rays were directed at them. Dr. Hewlett of the General Electric Company, the lecture assistant, demonstrated a new type of loud speaker of great promise. It dispenses with the usual horn and seems remarkably free from distortion. The diaphragm is very large and is actuated by pancake coils of special design. A detailed description will probably be found in one of the company's publications.

One of the interesting features of the meetings was the exhibit of scientific apparatus. The Central Scientific Company of Chicago showed some of their instruments including their Rotovac and Hivac Oil Pumps and their Mercury diffusion pumps. This company is showing a commendable effort to improve the appearance of their apparatus. There has been a chance for improvement in the past. Biddle of Philadelphia also made an exhibit including the Ediswan "Pointolite Lamp," an electric lamp of English make for obtaining practically a point source of illumination. The Leeds Northrop Company of Philadelphia showed one of their latest galvanometers which has a sensitivity of 1000,000 megohms - about a thousand times that of the popular Type P instrument found in most College Physics Laboratories.

FATHER HAGEN AND HIS JUBILEE.

Father John G. Hagen, for many years Director of Georgetown Observatory and now Director of the Vatican Observatory, had the rare privilege of celebrating last October the diamond jubilee of his entrance into the Society. In a note received from him in reply to a letter of congratulation, he states that Cardinal Ehrle and seven Provincials including our own Father Kelly were present at the Jubilee celebration. Fr. Hagen, besides being a distinguished mathematician and astronomer, is one of the world's leading authorities on variable stars. His beautiful charts of the latter are in constant use by observers. A detailed description of them with detailed directions for their use is given by Miss Furness, the director of the Vassar College Observatory in Chapter III. of her "Introduction to the Study of the Variable Stars." In the preface she acknowledges her obligation to Fr. Hagen in gathering the material for her book. "Die Veranderlichen Sterne" in two volumes by Hagen and Stein is a monumental work well worthy of a place in our College and university libraries. The first volume which is historical and technical,

is by Fr. Hagen himself. The second which deals with the physical causes of stellar variations, is by Fr. John Stein.

Fr. Hagen has a recent article in "Stimmen der Zeit" on the reform of the Gregorian Calendar, of which a brief abstract appeared in "America" for Feb. 23rd. For some years past, there has been an occasional discussion in various reviews regarding a radical change in our calendar. The two leading features of the reform have been to have a fixed date for Easter and to have the same days of the year always to fall on the same days of the week. The subject has been taken up by the League of Nations and in July 1923, an invitation was extended to the Holy See to send a representative to Ghent where delegates were to meet to consider the question. Fr. Hagen was selected for the post but asked to be excused. Fr. Gianfreschi of the Gregorian University was then sent in his place. The Anglican and Orthodox Churches also sent a representative. Fr. Gianfreschi, representing the Holy Father received a particularly honorable reception. The assembled delegates all rose as he entered the hall, and the president made a special speech extending his gratitude to the Holy See. No definite action was taken at the meeting. Further suggestions from various governments and religious bodies are expected. These are to be in the hands of the committee by Mr. 1st. Fr. Hagen describes the plan proposed twelve years ago by the Paulist Astronomer, Fr. George M. Searle, and shows how it would be a simple solution of the problem.

A NEW BOOK ON SOLAR ECLIPSES:

Dr. S. A. Mitchell, Director of the Leander McCormick Observatory, has recently published a book entitled "Eclipses of the Sun" (Columbia University Press, 1923) which will prove of interest to our professors of Astronomy and Physics. The author has taken part in four eclipse expeditions, travelling over 40,000 miles for the purpose. He was the first to obtain satisfactory photographs of the flash spectrum. He treats the subject historically and technically and gives a detailed account of his personal experiences. There are interesting chapters on topics treated only briefly or not at all in the ordinary textbooks, e.g. the problem of the flash spectrum, Saha's remarkable ionization theory. The book is well illustrated. Mitchell refers to the graphical methods for determining the time of eclipses employed by Fr. Rigge at Creighton University, and pays a tribute to Fr. Stephen J. Perry, S. J., for many years the director of the Stonyhurst Observatory. "The eclipse of of Dec. 22nd, 1889, is memorable from the death of Fr. Perry a few days after the eclipse, a martyr to science. This brave man though greatly weakened, took part in the eclipse work, and having found, as soon as totality passed, that everything passed off well, he called for three hearty British cheers, - which, unfortunately, he himself could not lead." Father Perry was in charge of this expedition which was sent out from England to the Isles de Salut on the H. M. S. Comus, and he died on the ship five days after the eclipse. Cf. Fr. Cotre's "Life of Fr. Perry."

MOTION PICTURES - COLORED AND EDUCATIONAL:

Fr. Ahern of Holy Cross sends us the following useful notes on motion pictures. We are glad to have a list of addresses of companies from whom educational films might be obtained.

The Technicolor Process of Motion Pictures in Color

Those of us who attended the Boston Meeting of the American Chemical Society in the fall of 1917 will not have forgotten the enthusiasm with which

a complete motion picture drama in natural colors was received by members in a special showing in Tremont Temple. The process was announced as the invention of two professors of the Massachusetts Institue of Technology and was called "Technicolor Process." About two years ago, a picture called the "Toil of the Sea" was made and released and has since been shown in over 4000 theatres with not a single adverse comment from the exhibitors. An important insert, due to Technicolor has been made in the "TEN COMMANDMENTS," a georgeous film meeting with tremendous success wherever it is being shown.

The two principle leaders in the development of the process have been Herbert T. Kalmus Ph.D. and Daniel M. Comstock, Ph.D., the latter being the principle inventor. With them have been associated Leonard H. Troland Ph.D. who is a Tech graduate, now professor at Harvard, and co-author with Comstock of a well-known book, "The Nature of Matter and Electricity," and two other Tech graduates, Eastman A. Weaver, and Joseph A. Ball. The company called "Technicolor Motion Picture Corporation," has been formed and an extensive plant constructed in Boston where alarge number of orders from various leading motion picture producers have been filled. The plant is the last word in motion picture laboratories and contains all the machinery to manufacture Technicolor positive film on a large scale. The process is such a great advance in the development of motion pictures that the following authoritative account for the benefit of ours who are interested is given:

"At the beginning of the development prior to 1914, it was realized by the engineers that perhaps the greatest single problem standing in the way of the production of motion pictures in natural colors was that of getting in the camera two images of the scene from accurately the same point of view at accurately the same time. At that time, the only pictures which had been shown commercially were marred by distressing "fringes" which always appeared on the screen whenever the object photographed moved with any but the slowest speeds. When a white horse wagged his tail, the audience saw a red tail and near it a green tail. Such a process was therefore useless for taking ordinary photoplays which always include rapid motions.

"It is necessary in taking colored pictures at the present time to take two component pictures of the scene, one through a red glass and one through a green glass, and these must be superimposed either on the screen or on the film itself. The principle trouble with earlier processes was that the red and the green pictures were taken one after the other in alternation and therefore the object photographed had a chance to move between the taking of the two pictures on the screen. The engineers after long and persistent work discovered a method whereby light could be admitted through a single camera lens and then split up without distorting or blurring the images so that the two components could be simultaneously impressed on the film side by side. Under these circumstances the two pictures are taken through the same lens at accurately the same instant. The distressing "fringes" are therefore completely eliminated. It is claimed that prior to the invention of the "technicolor" system the attainment of this result had been generally supposed to be impossible.

"A special film had to be prepared much more sensitive than any on the market and a method worked out of superimposing the two component pictures with the necessary accuracy under ordinary conditions.

"The present Technicolor process may be briefly summed up as consisting of the following steps:

1) Preparation of a new, uniquely high-speed color negative for use in the camera.
2) Taking of two component pictures in the camera, one through a red-orange yellow screen, the other through a blue green screen. These

pictures are taken at exactly the same time from exactly the same point of view.

3) The preparation of a positive film having one of these pictures on one side and the other picture on the other side having an accurate automatic register.

4) The coloring of this positive film with a red-orange-yellow dye on one side and a green-blue dye on the other side in such a way that the dyes are taken up by the film in proportion to the density of the two images.

"It will be noticed that the colors red-orange-yellow, include one whole half of the spectrum, the others mentioned, practically the remainder."

Fr. M. J. Ahern

In addition to its other excellencies, Technicolor film has a markedly greater resistance to wear than ordinary black and white film. It can be shown in any kind of a motion picture projector. All in all it seems to have solved the problem of making movies in natural colors.

A NON-REWIND MOTION PICTURE MACHINE.

There has been recently perfected and placed on the market a device that can be applied to any motion picture projector, which makes it unnecessary to rewind the film after each showing. Besides the saving in time, there is the elimination of wear and tear on the film which is frequently greater during the rewinding process than during the actual showing of the film. Ours who are interested may write to the Feaster Manufacturing Company, 25W. 43rd St., New York City.

EDUCATIONAL MOTION PICTURES

The Department of the Interior, Bureau of Mines is distributing again an excellent series of films illustrating mining and manufacturing processes. These films are distributed free of charge, the transportation charges to and from Pittsburg being paid by the borrower. A list of these films may be obtained from the Bureau of Mines, Pittsburg, Pa.

Attention is also called to the motion pictures made and distributed by the Society for Visual Education, 806 W. Washington Boulevard, Chicago. These include subjects in Physics, Mathematics, Physical Geography, Regional Geography, Biology and Nature Study, as well as in the Economic and Political History of the United States.

A new series of films that is attracting agreat deal of favorable comment is called "Secrets of Life." These are microscopic pictures of insect life made possible by the invention of a process of illumination by "cool light," which makes it feasible to illuminate living insects brightly enough to photograph under the microscope without killing the creatures. Address: The Educational Film Exchange, which has offices in the principle cities of the country.

The General Electric Company of Schenectady N.Y. has a number of films for free distribution, illustrating the manufacture of all kinds of electrical apparatus. Among them is a film illustrating the modern theories of the structure of the atom.

Fr. M. J. Ahern.

NOTE: In connection with the non-rewind machine mentioned by Fr. Ahern it may not be commonly known to the science professors of our province that Fr. J. DeVilbiss of St. Louis University has developed a device for repeating the same film over and over again. It is automatic and is attached to a motor-driven portable projector. Its main use seems to be for advertising purposes.

Editor.

(Reprint)

Overcoming the difficulties of Biological Laboratory Work.

In several of our colleges the number of students taking laboratory work in various departments has become so large that extra laboratory assistants have become necessary in order that the work may be done efficiently in the time at our disposal. The problem thus confronts some of our deans as well as our professors of obtaining the right kind of assistants without increasing too much the salary budget. Mr. Busam of Woodstock who was formerly at Canisius College gives us one solution. This may induce other s to give the benefit of their experience.

At Canisius College it has been quite a problem to obtain efficient graduate assistants for laboratory work in the biological department. The offer of fellowships proved of no avail in obtaining such assistants. Is this difficulty due to the fact that future employment in the field of biology is somewhat discouraging? How get around the impediment?

The following experiment was tried with success at Canisius College. Three of the best students who had just finished their first year of the pre-medical course were employed to assist in the biological laboratory. The sequel has shown the possibilities of such a plan. Fr. Ahern (Missouri Province) who has been professor of biology at Canisius College has remarked with enthusiasm the devotedness of such assistants. (Cf. Bulletin of the Biological Section of the Missouri Province).

Are there difficulties in the way of such a plan? It might be said that the youth of these assistants would detract from their prestige, especially in the ranks of their own class. Special training, however, and careful supervision on the part of the professor in charge will do much to offset this danger. A little help on the part of the professor will prepare them to assist the students of the first year pre-medical. Special preparation, however, will be necessary to make them efficient assistants to the members of their own class, i.e., the second pre-medics. This consisted in attendance at the ordinary class lecture, while anticipating under supervision the laboratory work during their free hours. That they would be required to assist others rendered them very careful and particular even in the most minute points of their work. Here is the secret of success.

As a rule, a little persuasion will often induce one or more of these assistants to complete the full college course. At the same time, they will continue their assistance in the laboratory. Thus enthusiastic assistants are acquired as experience proves.

How remunerate these assistants? The college authorities will remit their tuition and laboratory fees during the first year of their assistancy. Then if they continue, the price of all necessary class books gotten from the bookstore will also be remitted.

For work, they may assist in the laboratory of the different biological divisions. At Canisius College, there were three such divisions, - first year pre-medical, second year pre-medical, the general biology course which is of obligation in the sophomore class of science. This aggregated a total of twelve hours. They also corrected and checked up practically all of the drawings and descriptive work required in the courses of botany and zoology. But in the special course given to the pre-medics on the rabbit, no drawing or descriptive work was exacted. In a later issue of this Bulletin a further description of the latter course, together with a description of the method and the apparatus employed in the embalming and the preserving of the rabbits will be given.

The existence of the extension courses in some of our colleges may enable future assistants to take one course of the following year's work and thus lighten the years burden. Though this practice is not at all essential, it has been found extremely profitable and has tended to greater efficiency.

Comment on the above plan is invited.

Joseph F. Busam, S.J.

(Reprint)

LECTURE DEMONSTRATIONS:

Mr. John A. Daly of Woodstock proposes a question regarding teaching methods which would call forth some lively discussion. Educators are beginning to realize more clearly that without necessarily sugar-coating our courses, we can learn a great deal in our teaching from the psychology of salesmanship. This is true not only in science and mathematics, but also regarding the classics. We must "sell" our wares, i.e. make them interesting and desirable to customers who at the outset are often listless and unwilling to buy. What place do lecture demonstrations occupy in this psychology? Mr. Daly's question evidently refers in particular to chemistry.

Is the prevailing conviction well founded that demonstrations during lecture are no longer in order? Rarely do they work successfully and so work to make the lecturer the recipient of ridicule not always silent and reserved, rather than help the student. Time was when it was easy to cover the matter assigned and demonstrations served a useful purpose in entertaining the class and affording variety to an otherwise tedious exposition. But lecture periods now are all too few for the matter to be treated. And we can ill afford to waste precious time waiting for the proper temperature for a reaction or to clear the room of choking vapors while the class indulges in exaggerated coughing and far from exaggerated uproar. Moreover serious accidents have occurred in these lecture experiments. The writer vividly recalls sitting in the benches and eagerly watching a demonstration for phosphoretted hydrogen rings. But befoe any rings appeared, he had to run through a barrage of zinc, yellow phosphorus and glass flasks.

John A. Daly, S. J.

CHARTS FOR LECTURES:

They were found very helpful for treating such subjects as the manufacture of nitric acid and sulfuric acid, illuminating gas, iron and steel and the like. Rarely does a text give illustrations of the complete processes. To sketch them on the board requires time and ability. None of us likes to hold up bad examples of art to the students. Some discarded window shades were salvaged from the cellar. The material is not too heavy, takes ink or paint perfectly, is durable, and can be rolled into a small space for storing. White or light yellow are perhaps preferred. Illustrations of the complete processes were assembled and copied in vari-colored waterproof inks, to a convenient scale. This can be done by a student assistant or by an obliging pupil who is a good draughtsman. A professional draughtsman would do it very cheaply. Tape may be sewed around the edges to afford protection, and eyelets punched in to facilitate hanging.

John A. Daly, S. J.

SOME CHEMICAL NOTES.

Mr. Shipple again sends us some useful references to chemical literature.

Some of the readers of the Bulletin, especially those engaged in the teaching of Qualitative Analysis, might read with interest "A Systematic Procedure for the Detection and Separation of Acids," by Z. Karaglanov and Mr. Dimitrov, in Chemical Abstracts, 1923, xvii, 3846. The abstract contains an abbreviated but complete scheme for acid analysis.

Another reference which will likely be of interest also to teachers of Qualitative Analysis is "A Light Filter," by L. M. McCay, in Jour. Am. Chem. Soc.,

1923, xlv, 2958. The filter, it is claimed, absorbs completely, not only Na light but also that of Li, Ca, Br, and Ba. Rb, and Cs, however, are not entirely absorbed, but the rareness of these elements auto matically obviates this difficulty. The K flame is seen to rise from the glowing Pt loop in the form of long, crimson very bright streamers when relatively large amounts of this element are present, and less so, but always visible, as the quantity diminishes. To prepare the filter, dissolve 310 grams of crystallized chrome alum in one liter of water in a large flask. After cooling, filter it and fill with it prismatic bottles, e.g. 10 cm. high from base to shoulder, and about 5 cm. square. Wooden stoppers will serve as corks. In using the filter hold it upright, close to the eye and 5 or 6 cm. from the flame. Insoluble siliceous materials should be finely pulverized, mixed with a) pure gypsum, or b) 4 parts pure calcium carbonate and one part resublimed ammonium chloride, and the mixture made into a thick paste with water. A bit of paste is then collected on the tip of the Pt loop, brought into the fusion zone of the bunsen burner and viewed through the filter.

Under the title "A Simple Device for a Sodium Flame" the Jour. of Indust. and Eng. Chem., 1924, xvi, 53, describes a very simple apparatus useful for polariscopy or other work requiring monochromatic light. On a bunsen burner an inverted rubber stopper is tightly fitted just above the air regulator. Onto this stopper a glass tube about an inch and a quarter in diameter is fitted reaching just a bit above the top of the burner. Around the burner tube, within the reservoir thus made, asbestos paper is wrapped loosely and held in place by two strands of Pt wire. The asbestos wrapping should reach to the top of the burner. The glass reservoir is now filled with NaCl solution, the asbestos serving as a sort of wick. It is necessary to wet the top of the asbestos before using. Once started, a steady yellow flame may be maintained as long as there is salt solution in the reservoir. One could prepare a number of such burners to be used with salts of different elements. Of course, the solutions will evaporate on standing in the reservoirs, but will then be necessary merely to add some distilled water.

George J. Shiple, S. J.

In the last issue of the BULLETIN (November-December, 1923) there appeared a "Query" by Mr. J. J. Sullivan, S. J. The following answer has been submitted.

In answer to Mr. J. J. Sullivan's query regarding the sodium test mentioned in Newell's Laboratory Manual, it has been suggested that professor Newell made a slip in using the name Tartar Emetic ($2KSbOC_4H_4O_6 \cdot H_2O$), - a nomenclature - relic from the times of the Iatrochemists -, for the ordinary sodium test reagent potassium hydrogen pyroantimonate ($K_2H_2Sb_2O_7$), which must be used in a neutral or slightly alkaline solution, giving the required precipitate.

$$K_2H_2Sb_2O_7 + 2\ NaCl = Na_2H_2Sb_2O_7 + 2\ KCL$$

Acids decompose the reagent, precipitating pyroantimonic acid:

$$K_2H_2Sb_2O_7 + 2\ HCL = H_4Sb_2O_7 + 2\ KCL$$

APPARATUS FOR ILLUSTRATING THE KINETIC THEORY OF GASES. (Valkenburg)

We are glad to give a place to our first contribution from foreign lands. Mr. J. J. Lynch, S. J., our last years efficient secretary, who is now studying Theology at Valkenburg in the pleasant valley of Het Geul in Holland, sends us the following account of an apparatus he has discovered in the Physics department of Ignatius-Kolleg.

There is one fine demonstration apparatus here mostly home-made and home-designed. Apparatus for the demonstration of the Kinetic Theory of Gases,

Universal Gravitation, and the paths of the alpha particles may be of interest. An account of the last mentioned appeared recently in the Zeitschrift fur den physikalischen und chemischen Unterricht. Time will admit of only the first being described here now. The apparatus consists simply of a square wooden frame, - about half the depth of a pool racking frame, but somewhat larger in area -, placed on a stout sheet of plate glass. This is then placed horizontally on the lecture table and constitutes our receptacle for the gas. This latter (the gas) consists of some 18 or 20 steel ball-bearings about a quarter of an inch in diameter. Two adjacent corners of the frame are connected by wooden strips (about 6 inches long and screwed to the sides of the frame) to the top surfaces of two fixed wooden pulleys (about 6 inches in diameter and fixed to the desk or to a rigid board.) These pulleys are connected each by a leather belt to a third triple grooved pulley, - the third groove being connected to the shaft of a small motor by a belt. The purpose of the pulleys, etc. is simply to give the frame a rotatory motion (though this can be done by the hand if necessary.) When the ballbearings are placed in the frame and the motor started, the balls are knocked about in every direction as they come in contact with the sides of the frame and with each other, and we have a representation of the behavior of the molecules in a gas. The temperature of the "gas" may be altered by changing the speed of rotation of the frame. To represent the relation between the pressure on the sides of the container and the number of the molecules present, the gong of a small bell is attached to one side of the frame, and a small piece of the latter cut away, so that a ballbearing striking that part of the frame will cause a metallic clink, the clinks occurring at regular intervals. If the number of the balls in the frame be now doubled, the intervals between clinks will be correspondingly shorter. A further addition to the outfit is an extra side to the frame which can be attached to the middle points of two opposite sides so as to divide the frame into two smaller ones. A small gate is cut in the middle of this extra side, just large enough to allow one of the balls to pass through freely. If all the balls be now placed in one half of the frame and the latter set in motion, the balls will gradually find their way into the second half of the frame through the little gate, until the number in each half of the frame is about equal. The balls then continue to pass back and forth, but remain about equally divided between the two halves of the frame. (No doubt this could be adapted to show diffusion by using different sized bearings.)

The following are the contents for Zeitschrift fur Physik, December 17, 1925.

1. Low Voltage Arc Lamp in Helium.
   Bar, Von Laue, and Edgar Meyer.
2. Measurements of A.C. in the Arc.
   Hagenbach and Wekrli.
3. Studies in Solarization.
   Helmut Sheffers.
4. Lorentz and Galileo Transformation.
   N. Raschevsky
5. Some Radiation Properties of Aluminum and Magnesium Oxides.
   Henning and Heuse.
6. Spatial Distribution of Energy of Radiations in Vacuo.
   W. Bothe.

Mr. J. J. Lynch, S. J.,
Valkenburg.

(Reprint)

Father Wulf's Electrometer.

Mr. Lynch in the above communication refers to several other pieces of apparatus desinged by Father Theodore Wulf, S. J., Professor of Physics at Valkenburg. We hope to be able to give descriptions of some of them in later issues of the BULLETIN. We may add a note here however about Father Wulf's well known bi-filar Electrometer. This instrument formed part of an exhibit of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington at the recent meeting of the American Association at Cincinnati. It is employed by them in studying the electric potential of the air. Mr. S. J. Mauchly of the Institution staff read a paper before the American Physical Society on a slight change in the construction of the instrument which, it claimed, makes possible a smoother temperature calibration curve. It will be remembered that the electrometer consists essentially of two delicate platinized quartz fibres joined at the ends and suspended in a metal box. The upper junction is attached to a stirrup of quartz fibre joined to the bottom of the box. When charged, the fibres repel each other, and their divergence is measured on a scale by means of a microscope fitted in one of the sides of the box. Mr. Mauchly stated that in the form originally used by the Institution, a plate of hard rubber served as a lower support, but in spite of invar rods a "squirming" effect was noticed with change of temperature which caused irregularities in the calibration points. A plate of brass was substituted in place of the rubber with insulating bushings. As a result the points lie more closely along a straight line. The Wulf electrometer has several advantages, among them being small capacity, excellent precision and sensitiveness, and portability.

A PROBLEM FOR OUR MATHEMATICIANS.

In Young's ELEMENTS OF ASTRONOMY, Paragraph 257, we read the following interesting note:

"The eccentricity of a conic determines its form. All circles therefore have the same shape, as do all parabolas also: parabolas(when complete) differ from each other only in size."

As stated here the proposition gives the impression that a simple and well known fact is being recalled to the mind of the student.

In paragraph 314 of his MANUAL OF ASTRONOMY, a somewhat more advanced text-book, which was written after the ELEMENTS, the note reads thus:

"All parabolas, of whatever size, and cut from whatever cone, are of the same shape, as all circles are, - a fact by no means obvious without demonstration, though we cannot give the proof here..."

In his GENERAL ASTRONOMY, which is the most advanced of the three text-books, though it was written before the other two, -(contrary to the laws of evolution which some future textual critic will adduce as proof that it was written last) - we read in paragraph 422:

"...the (complete) curve (i.e. parobola) will always be the same in shape, though of course its size will depend upon a variety of circumstances. The statement seems at first a little surprising, but it is true."

A comparison of these texts might make an interesting pedagogical study, but I would like to suggest here a problem for our mathematicians, namely, give a proof of the statement made by Young regarding the parabola from the principles of Analytic Geometry.

Father E. C. Phillips, S. J.

(Reprint)

FATHER JOHN T. HEDRICK S. J.

It may be of interest to note that both SCIENCE, Nov. 16, 1923, and POPULAR ASTRONOMY, Dec. 1923, published accounts of the late Father Hedrick. The latter paper especially gave a glowing tribute to his mathematical and astronomical abilities.

(Reprint)