A. M. D. G.

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AMERICAN ASSOCIATION OF JESUIT SCIENTISTS

(Eastern Section)

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THE 1924 MEETING.

The school year is far advanced and although visions of repititions and examinations are looming large on the horizon, it is well to keep in mind the coming Summer Meeting of the Association. All are agreed that last year's sessions were crowned with success and all returned to their respective colleges with renewed inspiration and enthusiasm. This year's meeting must be even more successful. A meeting of the executive committee was held at Georgetown on Easter Monday. Reverend Fr. Provincial was present to give practical evidence of his interest. We hope in the next issue to be able to give details regarding the time and place of the coming meeting. In the meantime let us get ready our papers on some topics of interest for our respective sections or prepare some subjects for discussion. There must be some point that you would like thrashed out. It would be well to communicate as soon as possible with the chairman or secretary of your section and give him the title of your paper or any helpful suggestions that may occur to you so that the program may be arranged in good season.

SOME COMMENTS:

It is gratifying to note that interest in the Bulletin is growing and that is is beginning to fulfill the purpose of its foundation. We have received several notes of commendation. Father Ahern writes, "the last number of the Bulletin was a great improvement on the first, and I congratulate you heartily on it. I get several useful hints from it myself and I am sure that others have found it just as useful as I did."

Mr. O'Leary, S. J. writes from St. Louis, "Let me congratulate you on the very readable and instructive issue and wish you continued success in the work."

The April number of High-Voltage one of the publications of the Missouri Association contains these kind words, "We welcome this new comer into the inner circle of Jesuit Publications. As the name indicates, it is a general Bulletin of the Association, and contains matters of interest to all sections. It is newsy and full of inspiration and spirit. The many references to "OURS" make it particularly appealing. May God prosper the work. Ad Multos Annos." --Many thanks. We may add that not only HIGH-VOLTAGE but also other bulletins of the Missouri Association which have come to our notice are most interesting and helpful. The articles and references are timely and the general tone gives evidence of an active and enthusiastic interest in scientific work among our brethren of the Middle West.

BLOOD CIRCULATION AND ITS DEMONSTRATION:

There is probably nothing in the realm of biology more interesting than

(Reprint)

the study of the actual blood stream in a living specimen. The students can be prepared for this in several ways. After some lectures have been delivered on the subject smears or prepared slides showing the erythrocytes and leucocytes can be studied so that these can be differentiated later on. Some might even be willing to have specimens of their own blood taken and studied. This latter has the further advantage of revealing occasionally some of the abnormal forms of the red corpuscles such as the crenated type. Prepared slides of bone marrow may also be studied for the nucleated corpuscles (red) and the polymorphonuclear leucocytes.

Naturally too, the students will be interested in seeing the actual heart beat. This can be shown in several ways. A large bull frog such as Rana Catespiana can be anaesthetilized with ether and the thorax laid open. As this animal stands both the ether and the shock of the operation very well, the heart beat can be observed for quited some time. The same thing can be done of course with a mammal like the cat, but these larger animals are not so submissive to the ether. Again, if there is an X-ray machine at hand, for example in a neighboring hospital or doctor's office, the class can be shown the human heart at work by having two or three of the boys stand behind the screen in turns. A third method and one that affords simple matter for a talk on finality is to incubate fertilized chicken eggs for one, two, three, and four days in separate groups. If an egg is opened on the first day of incubation after the fifteenth hour, all that can be seen is a tiny white streak:but if one is opened about the forty fourth hour there will be visible a tiny red dot, - the embryonic heart. An egg opened about the fiftieth hour shows visibly the pulsing of this tiny pump. Eggs of later incubation, of course, show the pulsing rhythmically of the enlarged heart. An ordinary hand lens is an aid to the study of the earlier stages.

You will have mentioned to your class and explained the conversion of the intermittent current in the arteries to the steady flow in the capillaries. In a laboratory, a device can be set up to illustrate this. I joined together with a number of short pieces of rubber tubing a number of glass T-tubes with fine nozzles, and after attaching the apparatus to a support connected one end by a six inch length of tubing to an ordianry water faucet. If you play the pump by squeezing intermittently the rubber tubing near the faucet, in the main stream the intermittent flow is visible while the flow through the fine nozzles is fairly constant. The results are not perfecr and the device is homely; but it is easily made, cheap, and illustrates the principle and the phenomenon. In conjunction with this experiment a cat or other animal can be etherized and an artery and a vein slit to show the difference of the flow.

The classical method for observing under the microscope the blood stream is to inject a frog with curare, pin the web of one foot to a thin cork block -- in the center of which you have made a round hole about a fourth of an inch in diameter to transmit the light from condenser to objective -- and observe under low or high power. The only objection to this method is that the frog may die from the effects of the curare before you have finished your study. A modification of this method which I have found successful overcomes this objection. Rana Catesbiana is a very tractable and patient animal and has a large foot which is admirable for purposes of study. Bind both the legs by wrapping a cloth around them two or three times and slipping rubber bands over the cloth at the upper, middle and lower portions of the leg. The web of one foot can now be pinned to the cork and observations made in the usual way. By this method can be seen the difference in flow in the arteries veins and capillaries, the different corpuscles, the sluggishness of the streams along the walls and the swifter flow in the center, the red corpuscles in the center of the stream and the white and larger corpuscles along the "banks," the amoeboid movements of the leucocytes and the elasticity and change in form of the reds as they accomodate themselves to the crowded conditions of the mad rush. The study may be continued as long as desired

without fear of jerking on the part of the patient, and at the end he is little worse for the service. In connection with the amoeboid movements of the white corpuscles the mention of an experience I had may not be out of place. A freshly killed cat was placed in a vessel filled with water and left there for two days. On the third day when I went to get the specimen, I noticed some blood trickling from one of the deeper parts. I thought I would take a look at a sample of the blood and examine it through a microscope. To my surprise, there were leucocytes present which manifested rather lively amoeboid movements. To eliminate the possibility of delusion from the stream motion, I took another drop placed it on a fresh slide and placed a cover glass on top. Fixing the slide carefully on the stage and allowing it to stand for some minutes, I then examined the sample and at once saw the amoeboid movements of the leucocytes. As there was no preservative in the water in which the cat had been lying, the activity of the leucocytes two days after the cat had been killed was surprising.

To return from this digression:- a third method of demonstrating the blood stream is as follows. A large bullfrog Rana C., may be etherized, a small slit made in the abdomen and the mesentary and the intestines pulled out. The student may then place the frog on an adjacent support, pull the mesentary over the microscope stage and there see the blood flow in the arteries and veins. With such a specimen, the vessels and circulating stream can be thrown on the screen with an ordinary Bausch & Lomb microsprojector. This makes a wonderful picture and serves to point out a number of phenomena, though differentiation between white and red corpuscles cannot be observed.

Finally, there is a film made by Dr. Herm, formerly at the Rockerfeller Institute and living now, I think, at Harrison, N.Y., which illustrates the circulation, heart-beat and other interesting phenomena of the vascular system. I saw this film four years ago in Philadelphia. It consisted of three reels and was then obtainable directly from Dr. Herm. It is well worth hiring.

R. J. McWilliams S. J.
Woodstock College

LECTURE DEMONSTRATIONS.

In our last issue Mr. John A. Daly S.J. of Woodstock proposed the question:- "Is the prevailing conviction well founded that demonstrations during lectures are no longer in order?" We believe that ist was Mr. Daly's intention to afford opportunity for discussion and for bringing out clearly the pedagogical purpose of demonstrations and the place they should hold in our teaching. Are they intended merely to entertain? Or have they a more serious purpose of bringing home clearly the matter under discussion in the class room? No doubt all our readers have definite views on the subject which we should like to have put on paper. We have received the following expressions of opinion. We should like to have some comments.

In the Jan. Feb. Issue of the Bulletin, Mr. John A. Daly asks what position lecture demonstrations should occupy in the psychology of selling chemistry to the student. In my opinion, the use of lecture demonstrations for this purpose is a pedagogical error and a great injustice to the science. Everybody will agree, I think, that the interest and attention of a class is to be gained chiefly, if not solely, by a teachers personality and enthusiasm for his subject, coupled with a clear presentation of the matter. Lecture experiments are intended

solely to clarify and fix in the minds of the students a theory, or the principles underlying some reaction, or some noteworthy property of an element. When they are performed with only this purpose in view, they will serve "per accidens" to create interest but merely because they help the student to grasp what the teacher has just said in an abstract way or in general. Hence to cosider lecture experiments solely or chiefly as a means of making lectures interesting is, I believe, to lose sight of their primary purpose and, used as such, will tend to have the opposite effect of creating interest in the teacher's "tricks" rather than in the study of the science of chemistry.

The objections to the use of lecture demonstrations on the score of loss of time or possible accidents holds true only when two indispensible preliminary steps to all lecture experiments are ignored or neglected. These are a careful judicious selection of the experiments and a painstaken adequate preparation before class. For example let us take the experiment of phosphine rings referred to by Mr. Daly. Suppose the teacher decides during or just before the lecture to perform the experiment. While preparing it before the class, owing to haste or distraction , he is apt to forget to displace all the air from the flask by a non-oxidizing gas. The catastrophe is inevitable. But if the experiment is carefully prepared before class, and the solution has been heated nearly to boiling beforehand and all the air has been carefully displaced by illuminating gas, loss of time during the lecture, or accident is already precluded. Then when it is desired to start the reaction during class, after allowing the gas to run thru the flask a few minutes more, a gentle heating of the flask with a low flame will start the reaction very quietly and quickly. With such preliminary steps performed before class, accidents, I believe, are almost impossible; and as for the time occupied in performing the experiment during class, it is performed practically while it is being explained.

As to the choice of experiments, keeping in mind the purpose and the character of the course, I believe, small simple experiments should be selected. Moreover, I believe in omitting from lectures as far as possible, experiments which all the students are to perform in the laboratory. But such experiments as the action of phosphorus on promine, or the making of phosphine rings, or the manufacture of sulfuric acid by the chamber process, etc. which none, or at most only a few of the students are to perform in the laboratory should be performed by the teacher in the lecture room or as demonstrations during the laboratory period.

Thomas P. Butler, S. J.

I feel that I can hardly agree with Mr. John A. Daly's views on lecture demonstrations. Far from being out of date, I am inclined to think that the real pedagogical values and potencies are being recognized more clearly every year. I will merely add that one of the most striking pieces of evidence in this regard is the very elaborate preparations for such work made in all the more recent science buildings throughout the country. I had occasion to see these recently at the new Sterling Laboratory at Yale, the new Science Hall at Boston College, the lecture halls at Columbia University, at Cornell, and Harvard Medical Schools, and at several other prominent institutions in this part of the country. Moreover all the modern textbooks especially in Physics and Chemistry seem to take it for granted.

The mere fact that some demonstrators have failed at times or have had accidents (due, it may be, to the men themselves) or have discarded lecture demonstrations as antiquated is surely no valid reason for every professor to abandon something which he keenly realizes serves his purpose most admirably. Such is not good pedagogy to say the least.

George J. Shiple, S. J.

(Reprint)

SOME REFERENCE TO THE CHEMICAL LITERATURE:

DID YOU NOTICE:

That in the Feb. Jour. of Biol. Chem., 1924, work done in five Jesuit Universities is reported, namely Creighton, St. Louis, Fordham, Loyola, and Marquette?

That the Bock Prize Essay demands prohibition of munitions of war? Cf. J. Ind. & Eng. Chem., Feb. 1924, p. 114, "Easy Money."

The chemical terminology should be made simpler? Cf. Dr. Sy's article, J. Ch. Ed., Feb. 1924.

That the conscienticus teacher of chemistry is not without praise? Cf. J. I & E Ch. Mar. '24. in an article by W. A. Patrick.

OR DID YOU NOTICE:

List of research Problems, J. I. & E. Ch. Mar., 1924, p. 304?

Detailed description of the Helium laboratories of the U. S. Bureau of Mines? J. I. & E. Ch. (Anal. Ed.) Mar. 1924.

A.C.S. Prize Essay for pupils of secondary schools? J. I. & E. Ch. Feb. '24 p. 189.

Senate Document #44? "Uses of alcohol in scientific research and lawful Industries."

The continued ascendency of Pasteur's methods (though his name is not mentioned) for separating optical isomers of the acids? Cf. J. Biol. Ch., Feb. 1924. "Resolution of Inactive Malic Acid." Cf. also Cohen "Theoretical Organic Chemistry," p. 358.

Laboratory Methods in Analytic Chemistry, "A College Course in Analytic Chemistry," W. H. Chapin, (Oberlin)? (Note the insistence on the ionic interpretation of reactions.) Cf. J. Ch. Ed., Mar. '24.

J. J. Sullivan, S. J.

ALL PARABOLAS HAVE THE SAME SHAPE.

The proof of this statement was proposed by Fr. E. C. Phillips, S. J. in our last issue as a problem for our Mathematicians. We have received the following solutions. (A, B, C).

A. The standard equation of the parabola is $y^2 = 4px$. From this we may obtain any desired parabola by choosing a proper value of p. If now, we keep p constant and merely change the size of the unit of measurement of x and y, we will change the size, but not the shape of the curve. Algebraically, we may do this by substituting the value x/k for x and y/k for y, in which k represents the number of times that the new unit of measurement is greater than the first one. This substitution gives us:- $(y/k)^2 = 4\ p\ x/k$ and hence $y^2 = 4\ kpx$. By inspection we can see that the changing of K in the second equation where p is constant is equivalent to the changing of p in the first equation where the unit of measurement is constant. Since by varying k, we merely vary the size of the unit of measurement, the varying of p is equivalent to changing the size of the unit of measure. But the changing of size of the unit of measure does not change theshape of the curve. Hence the varying of p in the first equation does not change the shape of the curve. But all parabolas obtained from the equation $y^2 = 4\ px$ are obtained by

changing p. Therefore all parabolas are of the same shape.

John J. Long
Woodstock College

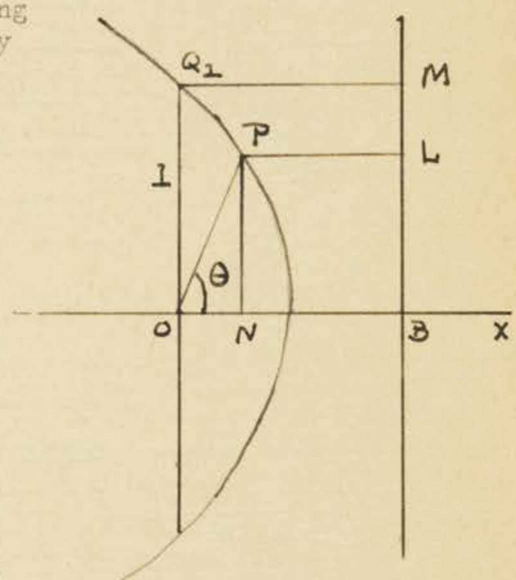
B. A proof of this proposition may be obtained from the text "Analytic Geometry", Clyde E. Love, pp. 107, 148-149 (Macmillan 1923). However the following summary may be satisfactory to those without the text.

1°. Polar Equation of a Conic.

In the figure we take the focus as pole and a line through the pole perpendicular to the directrix as polar axis. Denoting by 2 1 the length of the latus Rectum Q_1Q_2, then by the definition of eccentricity, OB (or Q_1M) $= \frac{1}{e}$. Assuming any point P (r,θ) on the curve, $PL = \frac{r}{e}$. Then since the algebraic sum of ON and $PL = OB$ (or Q_1M), $r \cos\theta + \frac{r}{e} = \frac{1}{e}$. Solving for r, the polar equation of a conic takes the form,

$$r = \frac{1}{1 + e\cos\theta}$$

, where r is the radius vector, 1 is $\frac{1}{2}$ of latus rectum, e is the eccentricity of the curve, and θ the polar angle.

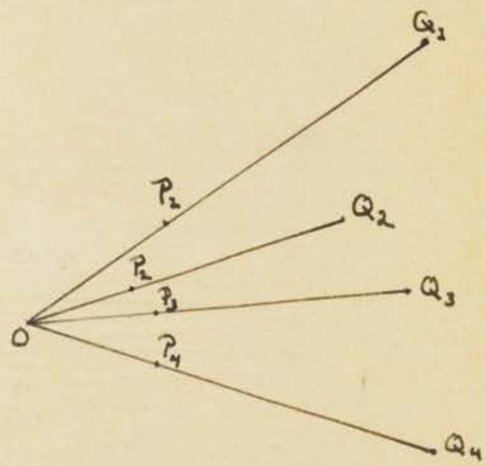


2°. Similar and Geometric Figures.

Two sets of points, P_1, P_2, P_3, ... Q_1, Q_2, Q_3,..... are similar if they can be so placed with reference to a point O that every line joining O to a point in the first set passes through a corresponding point of the second set, and that the point O will divide segments between corresponding points in the same ratio. For example, in the figure, if

$$\frac{OP_1}{OQ_1} = \frac{OP_2}{OQ_2} = \frac{OP_3}{OQ_3} = \ldots\ldots\ldots\ldots =$$

some constant k, then the sets of points are similarly placed with reference to O, the center of similitude. Since every plane geometric figure is the locus of all the points satisfying a definite set of gemoetric conditions, two such figures are said to be similar or to have the same shape, when the two sets of points included in the figures are similar. Thus with reference to a common center, two circles or two equilateral triangles are similar. They are, further, equal if when superimposed on the other, they coincide throughout.



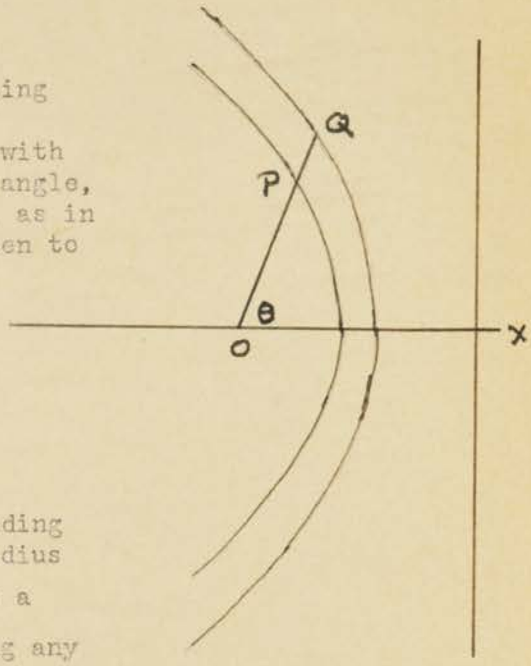
3°. Similarity and Equality of Parabolas

The eccentricity of the parabola being unity, its equation in polar coordinates is

$$r = \frac{1}{I + \cos\theta}.$$

Assuming any two parabolas, those equations may be,

a) $r = \dfrac{l_1}{I + \cos\theta}$, b) $r = \dfrac{l_2}{I + \cos\theta}$, and placing them with foci at the pole and axes coinciding with polar axis, we take any value for θ, the polar angle, and draw a radius vector to the outer parabola, as in the figure. The following relations will be seen to subsist.



a) $OP = \dfrac{l_1}{I + \cos\theta}$, b) $OQ = \dfrac{l_2}{I + \cos\theta}$,

which gives by the division of a) by b),

c) $\dfrac{OP}{OQ} = \dfrac{l_1}{l_2}$. Since the polar angle is any angle and is the same for any pair of corresponding points on the two curves "cut" by any chosen radius vector, and furthermore since the ratio $\dfrac{l_1}{l_2}$ is a constant, it follows that the segment PG joining any pair of corresponding points is divided by the point O in a fixed ratio. Hence the proposition, all parabolas are of the same shape. The size of the curve is determined evidently by the radius vector coinciding with the axis, or by the distance from pole to vertex. Two parabolas having the element equal will coincide throughout and will have the same size.

John J. Murphy, S. J.
Georgetown University.

A conic is the locus of a point whose distance from a fixed point (the focus) bears a constant ration to its distance from a fixed straight line (the directrix). This ratio is called the eccentricity of the curve.

The general equation is: $y^2 = x^2 (e^2 - I) + 4p (x - p)$ (a), where e is the eccentricity, and 2p is the distance from the focus to the directrix.

Suppose we keep $\underline{e}$ fixed in value. The curve has now a definite shape, depending on the value of p. By changing the units in which x and y are measured, which may be done by substituting for x the value kx, and for y the value ky, we merely change the size of the conic, but not its shape, as we have used only a larger or smaller scale, but not its shape, as we have used only a larger or smaller scale.

Thus: $k^2y^2 = k^2x^2 (e^2 - I) + 4p (kx - p)$.

Dividing by k^2, we get $y^2 = x^2 (e^2 - I) = \frac{4p}{k}(x - \frac{p}{k})$ (b), which represents a curve of the same shape as (a) but of different size. Now this same equation (b) may also be obtained from (a) by giving a new value to p, since in the equation (b) p alone is affected by k. Thus the effect of changing the units of measurement of x and y is equivalent to making p larger or smaller according

to the value of k. But by varying p we would obtain all possible conics for the particular value of e. But the varying of p is equivalent to changing the units of measurement of x and y. Since the changing of the unit of measurement changes the size of the conic but not its shape, therefore the changing of the value of p changes merely the size, leaving the shape unaltered for the particular value of e. Hence, for the given value of e, all conics would have the same shape, though differing in size.

Now e = I is the only value which will give us a parabola (for e greater than I gives an hyperbola; e less than I gives an ellipse; and e = 0 gives a point or a circle.)

Hence, the value of e determines whether the conic will be an ellipse, a parabola, an hyperbola, or a circle.

Since, therefore, e determines the shape of a conic, and it is constant for the parabola, all parabolas have the same shape.

George A. O'Donnell, S. J.
Woodstock College.

N.B. (Printer's Note.) In the above mathematical communications the letter "I" stands for the figure "one," and the symbol "l" represents the small letter "ell."

TWO UNIQUE BROADCASTING EXPERIMENTS.

An impressive radio relay experiment carried out a few weeks ago brings to mind the rapid progress made in the art of human communication even during the past ten years. The telephone when invented by Bell found the telegraph already in the field. It soon made itself indispensable, however, in business and social life, and distances through which human speech could be transmitted increased until in 1893 New York and Chicago were connected by wire. It was not until 1915 that the Atlantic and Pacific coasts, thanks to the vacuum tube relay, were linked together by a toll line. In June of the following year the American Telephone and Telegraph Company carried out what might perhaps be called a slective broadcasting experiment, in connection with the dedication of the new buildings of the Massachusetts Institute of Technology. The occasion was the Alumni reunion. Symphony Hall in Boston, in which it was held, was connected by wire with 34 different cities throughout the country, from Boston to San Francisco, and from Duluth to New Orleans. Local branches of the Alumni Association met at the same time in each of these cities, and each alumnus and guest, including those assembled in Symphony Hall, was provided with a telephone receiver. The speakers on the stage in Boston spoke into a transmitter in an ordinary tone of voice and were heard by the "listeners" in almost every corner of the country. At the end of the exercises, the Star Spangled Banner was sung simultaneously by all. The experiment was a complete success and was considered "the most elaborate telephone stunt ever staged or likely to be staged for some time."

Less than eight years later, on March 7th. 1924, on the occasion of the New York Alumni meeting of the same Institute, the Radio Corporation of America, The Westinghouse Company, and the General Electric Company carried out an even more remarkable experiment. The new voice - that of the radiophone, which in the meantime had made itself heard throughout the world - was employed. The scene of the meeting, the Waldorf Astoria Hotel in New York, was connected by

wire with WGY in Schenectady. WJZ broadcast the program on its usual wave length; WGY also sent it out on its ordinary wave length and simultaneously on a short wave length of about 100 meters. The latter was received by KDKA at East Pittsburgh and re-broadcast on the ordinary and on a short wave length. The short wave served a relay to KDFX at Hastings, Nebraska, and to 2 AC at Manchester, England. Hastings in turn broadcast on its ordinary wave length and on a short wave as a relay to KGO at Oakland, California. The latter station broadcast the program for the Pacific Coast. It was planned to span in this way a belt of the earth from London to Honolulu. The experiment showed that it was now possible for one voice to be heard throughout the whole country. Mr. David Saranoff of the Radio Corporation, one of the speakers, made some comparisons of the power used in broadcasting with that employed by the human voice. He stated that the human voice has a power of one hundred millionth of a watt. A 500 watt broadcasting station with a range of 1000 miles employs, therefore, a power fifty billion times as great. The population of the world is about one and a half billion. If all the people of the world got together and spoke at the same time, the energy would represent only about one thirtieth of that of a broadcasting station. The six stations broadcasting the program simultaneously on March 7 used a power about fifteen hundred times that of the collective voice of the world.

ST. AUGUSTINE AND MAGNETIC INDUCTION.

Some of our readers have no doubt seen a quotation from St. Augustine in a review of Mottelay's "Bibliographical History of Electricity and Magnetism." The receiver, H. Crew, says that some of the dearlier descriptions of magnetic phenomena are surprisingly accurate, and as a proof cites a passage from the De Civitate Dei of St. Augustine. No further reference is given. It may be of interest to give the passage in the Great Doctor's own words. "Magnetem lapidem novimus mirabilem ferri esse raptorem: quod cum primum vidi, vehementer inhorrui. Quippe cernebam a lapide ferreum annulum raptum atque suspensum; deinde ferro tamquam quod rapuerat, vim dedisset suam, communemque fecisset, idem annulus admotus alteri, eumque suspendit, atque ut ille prior lapidi, sic alter annulus priori annulu cohaerebat; accessit eodem mode tertius, accessit et quartus, jamque sibi per mutua circulis nexis, non implicatorum intrinsecus, sed extrinsecus adhaerentium, quasi catena pependerat annulorum. Quis istam vim lapidis non stuperet, quae illi non solum inerat, verum etiam per to suspensa transibat, et in visibilus a vinculis subligabat."

(De Civitate Dei, Lib. XXI, Cap. iv.)

We may also cite another passage from the same chapter, not referred to in the review:- (St. Augustine also remarks that this magnetic induction likewise takes place through silver.) "Sed multo est mirabilius quod a fratre et coepiscopo meo Severo Milevitano de isto lapide comperi. Seipsum namque vidisse narravit, quemadmodum Bathanarius quondam Comes Africae cum apud eum convivaretur Episcopus, eumdem protulerit lapidem et teneurit sub argento, ferrumque super argentum posuerit; deinde sicut subter movebat manum qua lapidem tenebat. Ita ferrum desuper movebatur, atque argento medio nihil patiente, concitatissimo cursu ac recursu infra lapis ab homine, supra ferrum rapiebatur a lapide. Dixi quod ipse conspexi, dixi quod ab illo audivi, cui tanquam ipse viderim credidi."

A still earlier reference to magnetic induction may be found in Plato's Ion, 533, D.

NOTES FROM CHEMISTRY DEPARTMENT OF GEORGETOWN UNIVERSITY.

"We have organized a Chemical Society this year, and with a membership of about forty five we have made a good start. I have a number of speakers promised from among the government men and I will avail myself of this good fortune next year. We have had three meetings this year. That is sufficient for the present, since we started only in the second term. Our constitution is modeled after one suggested in the A.C.S. New Bulletin for local sections, with a few changes. After the organization meeting we arranged for the first regular meeting in which one of the members gave a talk on Petroleum. We had four reels from the Department of Mines, which added to the interest. Our second regular meeting was the occasion of a talk by a member on Nitrates. Two reels added to the interest of the talk which held the attention of all. Our next talk will probably be given by one of the government Chemists. He has promised us, and unless he is called away, as frequently happens in his work, he will surely come. However, if he is unable to come personally, he will send a substitute from his staff. This will probably end our sessions for this year, but we have organized, have held some meetings, and can look forward to success.

"Another note of interest concerns our Freshman B.S. and Freshman Pre-medical classes. These classes use "Elecenary Chemical Calculation," by Martin Meyer, for problem work. The problems are assigned twice a week, and have been of considerable help. The Oxford Book Company, New York, publishes the text."

Vincent A. Gookin, S. J.
Georgetown University.

THE CHEMISTRY SEMINAR AT HOLY CROSS.

An attempt is being made at Holy Cross to interest a number of the more earnest students in the latest developments of the chemical and physical sciences. For this purpose a Chemistry Seminar has been established, which meets once a week for about an hour and a half, under the chairmanship of the Professor of Chemistry, to listen to and discuss a paper by one of the members, and hear short reports on recent developments in science which the members may have come across in their reading or study in preparation for the work of the Seminar. The lay instructors in all the science departments of the college are taking part. So far the attendance, which averages about thirty a meeting, has been splendidly kept up, and the papers and the discussions have been of extreme interest. The subject for the present year is "The Structure of the Atom." The subject is being treated historically, the list of the topics being:-

1. Existence of the Atom - Dalton, and the Laws of Definite and Multiple Proportions.
2. Avogadro's Hypothesis and Molecular Weights.
3. Prout's Hypothesis and Its Recent Revival.
4. The Electrochemical and Dualistic Hypothesis.
5. Faraday's Law and the Discontinuous Nature of Electricity.
6. The Periodic Law.
7. Discovery of X-Rays and Radioactivity.
8. Thompson's Corpuscles.
9. Electrolytic Dissociation.
10. The Rydberg Constant.
11. Moseley's Atomic Numbers.
12. Electrons and Protons.
13. Evidence for Electrons.

14. Evidence for Electrons.
15. The Atom of the Chemist.
16. The Atom of the Physicist.
17. Reconciliation of the Two Views.
18. The Theory of Valence.

The Seminar is proving particularly useful for those students who are preparing to teach the sciences in High Schools, and for those who are preparing to take up engineering as a profession. While the subject of the Atom can not be entered into very deeply without a good deal of mathematics, there is available a copious literature that is accurately descriptive and does not demand more methematics than is possessed by the average Senior or Junior in our colleges who is taking his science seriously. And there really are some few such students among us. In a later communication a few easy experiments illustrating the phenomena of atomic disintegration will be described.

Father M. J. Ahern, S. J.
Holy Cross College.

OCCULTATION OF ALDEBARAN.

An occultation of Aldebaran occurred on April 8. It took place in broad day-light and the phenomenon could be seen only with a telescope. The occultation was observed at the Woodstock Observatory with the three inch equatorial by Father E. C. Phillips at immersion, and by Mr. F. G. Power at Emersion. The computed and observed times were as follows:

	Computed	Observed
Immersion: April 8th.	$1^h\ 53.6^m$	$1^h\ 53^m\ 25^s$ E.S.T.
Emersion:	3 25.2	3 25 ..

The occultation thus occurred 10 seconds before the predicted time.

PUBLICATIONS.

Popular Astronomy, March, 1924, has two articles by Father W. F. Riggs. S.J., one entitled "The Reform of the Present Calendar Begun," based, as he states, on the article by Father Hagen, mentioned in our last issue, and another "Occultation of Aldebaran" (April 8, 1924.) Father Luis Rodes of the Ebro Observatory at Tortosa, Spain, also has an article in the same number on the "Effect of Cosmic Clouds on the Period of Variable Stars."

The April number of this Journal contains abstracts of the papers read at the Vassar Meeting of the American Astronomical Society, last December. Among them is one by Father E. C. Phillips, entitled "An Astronomical Ceiling Design." FatherPhillips appears in the group picture of the Meeting which serves as the frontispiece of the March number. We also note Father Rodes in the frontispiece picture of the April number entitled "Disappointed Eclipse Observers at Camp Wrigley, near Avalon, Catalina Island, Sept. 10, 1923. The party was sent out by the Yerkes Observatory under the direction of Director E. B. Frost, but could make no observations on account of clouds. In his article describing the preparations made Director Frost says, "Father Luis Rodes, Director of the Ob servatorio

del Ebro at Tortosa, Spain, gave us a pleasant surprise by arriving at Avalon a few days before the eclipse. He decided to make visual observations on the corona as well as of the shadow bands and stationed himself near Professor Merrill."

Father Rigge also has an illustrated article on "Stereoscopic Harmonic Curves," in the January number of School Science and Mathematics. He contributed a note on the problem of "The Monkey and the Weight" to Science, March 21. By an oversight we omitted making mention of Father F. A. Tondorf's article on the Japanese earthquake in the October number of the National Geographical Magazine. It was preceded by a full page illustration of Father Tondorf beside one of his seismographs.

As noted in Science, April 4th, Father Tondorf addressed the Philosophical Society of Washington on April 5th on "The Seismogram and its Interpretation." He also addressed the University Club in Washington last February on, "Earthquake Registration." Father Tondorf has been installing a new seismograph at Georgetown of which we hope to give an account in a later issue.

MEETING OF THE AMERICAN CHEMICAL SOCIETY.

Several of our chemists including Father G. J. Pickel S.J., of Campion College, attended the Meeting of the American Society held in Washington during Easter Week. Father G. L. Coyle, S. J. read a paper on "Pioneer Applied Chemistry in North America." A paper was also contributed by Drs. C. P. Sherwin and L. R. Cerecedo of the Department of Chemistry of Fordham University, entitled "Detoxication of Aromatic Cyanides."

THE SCIENCE SUMMER SCHOOL

Reverend Father Provincial announces that the Science Summer School will be held this year at Holy Cross College, Worcester.

L.D.S.