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THE JANUARY ECLIPSE.

On the morning of January 25, 1925, there will be a total eclipse of the sun visible in the eastern part of the United States. The following references are given for those interested, the references being arranged roughly according to the importance of the matter contained in the articles mentioned:

1. Eclipse Supplement of the American Ephemeris for 1925. (This can be obtained for cash or money order at 30 cents per copy from the Supt. of Documents, Government Printing Office, Washington, D.C.)
2. Article on the eclipse by E.A. Fath in POPULAR ASTRONOMY for May, 1924, pp. 298-302.
3. Maps of the eclipse, by Father Rigge, in POPULAR ASTRONOMY for November, 1924, pp. 523-524.

The next total eclipse visible in the United States will occur on Sept. 9, 1945, so that the present one will be the last opportunity for many of us. It is especially interesting from the fact that for the first time in very many years the path of totality covers a densely populated section in the northern part of the United States. Several large observatories such as Yale, Middletown, Vassar are included in it. If conditions are favorable hundreds of thousands will be able to enjoy the wonderful spectacle. Our High Schools and Colleges will be especially interested. According to Russell this will be the first eclipse visible in New England since June 24, 1806. Unfortunately the conditions for this eclipse are not very favorable; the sun will be rather low in the heavens and the probability of cloudiness is rather high,-- for most places over 50 per cent. Buffalo and Poughkeepsie are very near the central line of totality; New York is just on the edge of the path of totality, so also are Providence and Springfield: Boston is outside of the path of totality, as are also all cities south of New York, but the eclipse will be visible as a partial one throughout the entire eastern portion of the United States. The Eastern Standard Times of the beginning, middle and end of the eclipse are given in the following table for a number of stations as indicated by Father Rigge's maps:

Place	L.S.T. of beginning	middle	end
Buffalo	7:59 A.M.	9:08 A.M.	10:24 A.M.
Poughkeepsie	8:01 "	9:12 "	10:33 "
New York City	8:00 "	9:11 "	10:31 "
Philadelphia (partial)	7:58 "	9:08 "	10:28 "
Washington (")	7:57 "	9:05 "	10:26 "

The eclipse can be readily observed through a plate of smoked glass, or through very dark spectacles, or by projecting the image of the sun on a piece of white paper by means of a telescope. Even a surveyor's transit can be used in this way, provided the eyepiece is moved out sufficiently to make the image on the paper sharp.

It is probable that all the newspapers published in the eastern part of the States will contain detailed information on the eclipse and the manner of making amateur observations in connection with it; the magazine and feature sections of the issue of Sunday, Jan. 18, will doubtless carry some special articles on the subject.

Father E.C. Phillips S.J.

CHECKING LABORATORY WORK IN BIOLOGY.

If we may judge from the reports of the teachers and the claims of the students, in many of our schools as well as quite generally in the great secular universities, there is a decided tendency among the students of college biology to "fake" their drawings, that is to copy the drawings without actually performing all the work those drawings stand for. And this quite-to-be-expected tendency meets with not a little success. What are our teachers doing to insure honest work? In some of the secular universities I have seen very clever stamping devices which certainly render it impossible for the student to make his drawings outside of the laboratory. And careful watching may prevent copying in the laboratory. But the latter precaution will deprive the student of many a valuable reference book. Moreover drawings are apt to be memorized before coming to class, if for no other reason than to "beat" the professor.

Then, too, the credit system in vogue today tends to make the student look more to credits and a book of certified drawings than the work these things stand for. How many students actually see the cilia of the ciliated epithelium? Or in a dissection how many actually trace e.g. the branches of the hepatic portal system? In the vago-sympathetic system how many find all three cervical ganglia? A minute's reading will tell them where to place them in the diagram. Do not many students draw and diagram from memory rather than perform the actual work and study? And when they are clever how often is their deceit detected? In many of our big universities and probably also in our own schools this is a serious question.

In our laboratory in Manila we finally evolved a system of checking the work rather than the drawings, although the latter were examined with great care. In microscopic work the student after each drawing called the instructor of his section, who compared the drawing with the object under the microscope and then quizzed the student. Thus we forced the student to study the slide as well as prevented fake drawings. Likewise in dissection when the student finished a definite portion, such as the portal system, he was obliged to call the instructor and identify for him each and every vein and answer a short quiz. Even if he had found all the veins but failed to tag them with the correct names his work was not checked and he had to repeat.

At the end of class when the drawings were corrected and stamped, no drawing would be inspected unless the instructor's list showed a check mark beside the student's name for that particular experiment. We found this system very effective not only in preventing fakes but most of all in forcing the student to do his work fully and

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entirely. It was not a hit and miss, where the student did real work for ten minutes while the instructor was standing over him and then imagined the rest. His entire day's work had to be really done, and done thoroughly, for every bit of it was thoroughly checked. As near as I can judge from the numerous laboratories I have visited the more common practice is to check all the drawings carefully, but only part of the work. Yet the work is the more important part. Then in connection with this checking system Mr. Reardon evolved a marking system which proved very satisfactory. This I shall try to explain in a subsequent issue of the Bulletin.

Mr. John A. Pollock S.J.,
Woodstock College.

AN AID IN CHEMICAL LABORATORY WORK.

A very important factor in successful laboratory work is the correct adjustment of the apparatus. All authors of laboratory manuals realize this and consequently they have not been satisfied with merely explaining how to set up the apparatus but have even gone thru the trouble and expense of inserting diagrams portraying the complete arrangement of the apparatus as it should look when everything is set up properly. However, it has been the writer's experience that frequently the diagrams have been omitted when they might well be inserted, because no matter how clear the directions might be still there are generally some students who will go astray with a consequent loss of time both to themselves and to the instructor. Moreover, even when there is a diagram it frequently happens that some of the minor connections are not clearly shown, with the result that some students will make a mistake which may spoil their experiment. Still even in those diagrams which are as perfect as could be desired it sometimes happens that the instructor for some reason or other desires to use a different type of flask or washing bottle, etc., than the one shown. Hence a new drawing will have to be placed on the board in the laboratory (if the laboratory is so equipped).

This question of diagrams undoubtedly has prevented some instructors from issuing their own laboratory manuals, which would be more suited to their own needs and equipment. Consequently the writer thinks that he has seen how all these difficulties may be overcome. When he was visiting the Chemistry Department of the Leland Stanford University he noticed that there was a table with all the apparatus completely set up and numbered for each experiment that would require a diagram. Undoubtedly this is as perfect as could be expected, and even when some student makes a mistake the instructor can simply send him to take another look at the model, thereby saving much valuable time for the instructor.

Mr. R.D. McCullough S.J.,
Woodstock College.

SOME CHEMICAL REFERENCES.

"Demonstration to Illustrate that Conductivity of a Solution is due to Its Ions", by G. Watts, in Jour. Am. Chem. Soc., 1924, xlvi, 1210. Start with a 5 per cent solution of $\text{Ba}(\text{OH})_2$ in a beaker, with Pt electrodes, a lamp and a battery in series. Add a few drops of phenolphthalein. The indicator, of course, shows a decidedly alkaline reaction. Now carefully neutralize the alkali with very dilute H_2SO_4 (about 0.1 N) from a burette. Keep stirring the solution during the

addition of the acid. The light gradually dims down until neutrality is reached (evidenced by the disappearing of the indicator's color) when it is extinguished, the conducting ions having been removed completely (practically).

"Solubility of CO₂ in Water", (A Lecture Demonstration), by F. Rischbieth, in Zeitsch. phys. chem. Unterricht, 1923, xxxvi, 120; abstracted in Chem. Abstr., 1924, xviii, 1413. A gas burette is filled with CO₂ from a generator, and 10-15 cc. of water is then forced into the burette. The latter is then closed and well shaken. If the amt. of gas dissolved is more than the amount of water admitted, on opening the stopcock more water will enter from the funnel attached. But if the volume of gas dissolved is less, some gas will escape. Now knowing the original volume of the gas and the volume of the final solution (saturated) it is a simple matter to compute (roughly) the solubility. It can also be shown that CO₂ will not give a precipitate with lime water unless the latter is present in excess to insure the reaction: $\text{Ca}(\text{HCO}_3)_2 + \text{Ca}(\text{OH})_2 = 2 \text{CaCO}_3 + 2 \text{H}_2\text{O}$.

Mr. G.J. Shiple S.J.

PERMALLOY. (concluded)

6. Theoretical Interest of Permalloy:-

The remarkable permeability of permalloy makes it an especially interesting study in the investigations into the causes of magnetism; so it is well worth while to review in some detail what light permalloy can shed on the subject. In the first place we have some negative results:-

- a) The heat equilibrium diagram does not point accurately to the composition exhibiting highest initial permeability. It points to 70 per cent not 80 per cent nickel.
- b) The conductivity curve is even less indicative of a peculiarity at this point, its minimum lying about at 35 per cent nickel.
- c) The crystal structure remains unchanged until the nickel content is made less than 35 per cent. The mean spacing between adjacent atom centers, and with it the density, vary continuously throughout the entire range. Thus writes Arnold. However, in this connection we must insert the words of L.W. McKeehan (Phys. Rev., Apr., 1923): 'The increase in the face-centered cubic space-lattice parameter of nickel due to the substitution of iron is evident, although not nearly so striking as the corresponding increase in other cases since studied'. Both Arnold and McKeehan are in the Western Electric Research Laboratories and both write at about the same time. Hence it is hard to reconcile the two statements. In addition to this we may state some interesting results from the investigations of Young (Phil. Mag., Aug., 1923) in connection with Heusler alloys. In these alloys there is no change in crystal structure on heat treatment that kills the magnetism; neither does a large magnetic field of 3500 gauss alter the crystal form.
- d) The series has no mechanical peculiarities at or near the 80 per cent nickel point. What is more surprising the mechanical properties are little affected by the heat treatments which so profoundly change the magnetic properties. So far as has been determined, therefore, it is only in connection with its magnetic properties that permalloy is unusual.

What can we conclude from these facts so far? It seems tole-

rably certain that the cause of the magnetization is not to be sought in the valency electrons, but is more deeply seated in the atom. Conductivity, according to the present theory, is a function of the valency electrons; if these electrons were also responsible for the magnetism, conductivity and magnetism ought to change similarly, but the change is found to be very slight, only 2 per cent, in magnetized and demagnetized specimens.

Let us now see if we can find some positive results:-

a) The conductivity change obtained by magnetization is the same as that obtainable by elastic strain. This is no mere coincidence, for we find that the maximum change due to either cause alone is not further increased by the superposition of the other, although the effects of small tensions and magnetizing fields are additive. This suggests, of course, that both causes ultimately produce the same change in the mechanism responsible for ~~the~~ conduction. It also seems to further the idea that the force binding the atoms of metallic crystals together are not electrostatic but magnetic. As McKeehan writes: the comparative weakness of metallic crystals would be a natural consequence of this less intimate connection between adjacent atoms which would thus form a transition stage between valence-held salt-like crystals and amorphous liquids.

b) Though once the crystal structure of the alloy has been completed, magnetization or demagnetization does not change the structure, yet there is abundant evidence that proper crystal structure is a prerequisite for the magnetism of iron and nickel and Heusler alloys. The facts are these:-

As regards the Heusler alloys, which are composed of copper, aluminum and manganese, Young has this to say:- 'The more ferro-magnetic Heusler alloy contains a body-centered cubic lattice, the more weak ones only face-centered cubic.'

How about the nickel-iron alloys? Up to about 25 per cent nickel, the body-centered cubic lattice is maintained as regards the iron, and with it the greater part of the magnetism of the iron. At about 25 per cent nickel up to about 35 per cent, the alloy can exist in two crystal states, the body-centered cubic of iron or the face-centered cubic of nickel. It is interesting to note that the permeability gets very low at about 25 per cent nickel and then rises rapidly as the face-centered cubic structure is more and more assumed. Young maintains that at 25 per cent nickel it is the body-centered cubic system that is magnetic and the face-centered cubic that is non-magnetic. On the other hand, the most pronounced permeability of permalloy is at 78.5 per cent nickel. Hence very little permeability at ratio of one part of nickel to three of iron, and very great permeability at the ratio of one part of iron to four parts of nickel. These relations certainly indicate that there is a relation between the crystal structure and the magnetic effects.

Is there a satisfactory explanation for all these phenomena? Not yet.

In conclusion, it must be emphasized that the whole theory of magnetism is very much involved at present and extremely baffling.

References:-

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 L.W. McKeehan, "Crystal Structure of Iron-Nickel Alloys",
 Phys. Rev., Apr., 1923, p. 402; also June 1923, p. 307.
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Father C.E. Deppermann S.J.

THE NEW SEISMIC STATION OF FORDHAM UNIVERSITY.

An event which has aroused popular as well as scientific interest throughout the country was the dedication of the new Seismological Observatory at Fordham University.

The station merits a detailed description by reason of the fact that the building housing the seismographs is one of the few in the world devoted exclusively to this work, and also because of the newly acquired Milne-Shaw instrument which is the third one of this type to be sent to this country.

The building is the gift of William J. Spain of New York City, and is erected in memory of his son, who was a student of Loyola School and of Fordham, and died during his sophomore year at the University. The building is one story high, 40' long by 25' deep, and is divided into three rooms. The first is a visitors' observation room from which the instruments may be viewed through plate glass windows, without introducing any artificial disturbances which might vitiate the records. The second is the instrument room proper, and the third is a photographic dark room and work shop.

In the instrument room there are two piers sunk to bed rock, one 20' deep, the other nearly 30'. On the smaller of these piers stands the Wiechert machine, and on the larger the Milne-Shaw. The future development of the station was taken into consideration in the erection of this larger pier, and its dimensions are such as to enable it to accommodate two more seismographs. When these are installed the station will be as adequately equipped as could be desired. The three machines will make possible the determination not only of the distance of the recorded quake but also the direction and specific location. The present Milne-Shaw machine records only the North-South component of the earth's motion. Thus the second instrument to be mounted on this same pier will be the same type recording the East-West component; the third will be a Galitzen vertical machine to record this third component of the earth's motion.

The Milne-Shaw instrument, which is a development of the old Milne seismograph, perfected by Mr. J.J. Shaw of West Bromwich, England, embraces practically all the advantages of the most sensitive types of seismographs, while at the same time it avoids many of the mechanical and electrical difficulties inherent in more complicated machines. This is due principally to its method of direct photographic registration. A small weight (1 lb.) is suspended on a boom which hangs from an upright column by two small cables and is pivoted at one end so as to permit it to swing horizontally in space with a minimum of friction. To the boom is attached a copper vane which moves in a strong magnetic field. The desired damping effect is then secured by changing the position of two horseshoe magnets with respect to the vane; the eddy currents thus set up in the vane oppose the motion of vibration and thereby bring the boom and mass to rest after each excursion. To the outer end of the boom is coupled a minute mirror. A beam of light is directed onto this mirror and reflected back into a recording box which contains a revolving drum covered with photographic paper.

When the weight and the earth are in relative motion due to an earth tremor, the apparent motion of the weight is transmitted to the mirror, and the beam of light reflected from this mirror is deflec-

ted through twice the angle of apparent displacement of the weight. Of course, the greater the distance of the recording box from the mirror the greater the linear displacement of the light beam at that point for a given angular displacement. By choosing the proper distance, 500 multiplications of the ground movement may be obtained, but in practice 250 multiplications are found more suitable.

The determination of the constants of the instrument are facilitated by an auxiliary mirror and millimeter scale. By means of a vernier leveling screw a change in level of 1 second of arc may be imparted to the standard, and then the deflection of the light beam may be measured in millimeters. In this machine the 1 second of arc reduces down to a distance of $1/10,000$ th of an inch, and the deflection in the light beam is then (in round numbers) 50 millimeters, i.e. practically 2 inches. Thus the instrument is particularly suited for measuring small changes in levels, such as deflections due to tidal loads, etc. On the instrument at Fordham the settling of the new concrete pier can be readily seen on the record by a daily change in the zero or rest point on the scale.

The record of the Milne-Shaw machine is made on bromide paper and develops out in a few seconds in neper solution, giving beautiful definition and a clear and clean sheet to work on. The time necessary for developing is less than that necessary for smoking and varnishing for the mechanically recording machines, and the results are vastly superior, due to the fact that the multiplying lever in the former case is a beam of light,-- the only frictionless lever obtainable.

The Wiechert machine is also kept in operation, acting as a pilot, since its record can be inspected at any time without removal.

The observatory is kept at constant temperature by a home-made thermostat. A standard Tycho recording thermometer is equipped with a fine copper wire attached to the style of the thermometer. When the style drops below a given division (which can be arranged for any desired temperature) the little wire dips into a mercury well, thus completing an electric circuit actuating the relay, and thus turning on a switch which controls two electric heaters fed from the house lines. Of course, when the temperature has risen again to the desired height the converse operation takes place automatically.

The observatory clock, which eclipses the light source every minute, is corrected twice daily from Arlington, and the wireless set is arranged in circuit with the clock so that both signals may be heard simultaneously. The hour dash of Arlington is recorded directly on the seismogram, making possible the use of a converging scale to correct the time on the gram with an accuracy of less than 1 second.

In the blessing of the seismograph performed by Bishop J.J. Collins S.J., a special prayer to the Patron of Seismology, St. Emigdius, was used. This prayer was sent to Fordham University by Pope Pius XI through his Prelate of the Sacred Congregation of Rites, Cardinal Scifoni, as was also a shield struck in brass, blessed personally by His Holiness.

Mr. John S. O'Connor S.J.,
Fordham University.

THE INTERIOR OF THE EARTH.

(A synopsis of a paper read at the November Disputations at Woodstock.)

What are the prevailing conditions of the interior of the

earth? To answer this question the geologist has given much time and thought during the past hundred years. As a result, three theories have been proposed; first, the earth is made up of a molten liquid interior encapsulated in a shell or crust of mean depth approximating forty kilometers; second, the earth essentially consists of an outer shell, not very thick, and of a gaseous nucleus; third, the earth is solid throughout. Each of these hypotheses has its arguments. The first is based on the increase of temperature downwards, on the existence of volcanoes and on the present complicated structure of the earth's surface. Perhaps the best presentation of this theory will be found in Osmond Fisher's "Physics of the Earth's Crust", second edition. Fisher was the last to support the liquid theory. The second solution is based on the behaviour of matter when subjected to high temperature and pressure. Sieberg in "Der Handbuch der Erdbebenkunde" sponsors this theory as also does Geikie in his "Textbook of Geology", volume II. The argument for the third hypothesis is taken from precession of equinoxes, nutation and tides. Lord Kelvin concluded that the earth could not withstand these distorting forces unless the mass of the earth "is on the whole more rigid certainly than a continuous solid globe of glass of the same diameter". An excellent summary of this theory may be found in Geikie's "Textbook of Geology", volume II.

Thus far the story of the question to the beginning of the present century. With the development of seismometry the evidence in favor of a solid earth was forcibly increased. From a closer study of the seismogram it was seen that following an earthquake both longitudinal and transverse waves were sent through the earth. Hence, the inference of the solidity of the earth. These seismic waves show us more. It was found that the velocity, determined empirically, increased steadily and rectilinearly down to the depth approximating 1600 kilometers; beyond this depth the velocity becomes almost constant for about 1400 kilometers. A direct inference from this is that somewhere within the earth there is a vast amount of material intrinsically denser than any known silicate rock. To explain this varying velocity the geologist had recourse to two facts based on measurements made in the laboratory; first, the velocity increases with pressure and hence with depth; second, the velocity is much less in metallic iron than in basic silicate rock. Therefore, it was argued that the first 1600 kilometers is composed of basic silicate rock; the next 1400 kilometers, of a mixture of silicate rock and metallic iron, called pallasite, in which the silicate rock gradually decreases and the iron gradually increases leaving the core of metallic iron.

We come to the same conclusion from an analogy with meteorites. From a close study of the spectrum the physicist and the astronomer are led to believe that the other heavenly bodies have the same constitution as our own planet. Therefore, it does not demand an unwarranted use of the imagination to regard meteorites as fragments of disrupted bodies similar to, although probably much smaller than, our own planet, and to reason that the structure and average composition of these bodies is not very different from those of the earth. Meteorites are classified into three main groups: siderites, composed almost wholly of nickel-iron; siderolites, composed of about equal parts of nickel-iron and silicates; and aerolites, composed almost wholly of silicates. The metal and silicates, when solidified, may be intermingled in two ways: first, the silicates may be scattered through a more or less continuous mass of metal, and second, the metal may be scattered through a more or less continuous mass of silicates. The

first is called lithospore, the second ferrosore. Since we find some meteorites composed almost wholly of nickel-iron, while others are composed almost wholly of silicates, and still others of a mixture of nickel-iron and silicates, we infer that in the earth there must be a zone of nickel-iron, another zone of basic silicate rock, and in between the two a zone composed of a mixture of nickel-iron and silicate rock. We may then suppose that in passing from the center outwards the almost wholly metallic core of nickel-iron changes gradually into pallasite with sporadic silicate. In this region the percentage of silicate gradually increases until the pallasite merges into ferrosoric material, with scattered grains of nickel-iron. The iron becomes less and less abundant until at about 1600 kilometers below the surface the material is entirely silicate rock free from metallic iron.

Summary: In view of the evidence it is suggested that the earth is solid throughout with a nucleus of nickel-iron surrounded by a zone of pallasite whose depth is about 1400 kilometers which merges into a zone of basic silicate rock approximating 1600 kilometers in thickness; the whole surfaced over with a covering of 60 kilometers thickness of decayed rock, soil and water.

Mr. Edmund J. Nuttall S.J.,

PUBLICATIONS.

SCIENCE for Oct. 31, 1924 has a note on the dedication of the new Seismic Station at Fordham University already referred to in this issue. The same review also published a more detailed description of the station on Dec. 5, 1924. Mr. J.S. O'Connor S.J., in charge of the station, also published a description in AMERICA for Nov. 22, 1924.

SCIENCE for Oct. 31, 1924, likewise contained the following which may be of interest especially to Ours: "The movement, started last May by the alumni of St. Louis University, to raise 1,000,000.00 for a new Medical College, has thus far brought a total of 410,000.00 in pledges, according to Dr. Hanau W. Loeb, dean of the School of Medicine."

POPULAR ASTRONOMY for Oct., 1924, has an article on the occultation of Aldebaran, Sept. 19, 1924, and one on the occultation of Regulus, Oct. 23, 1924, by Father Wm. F. Rigge S.J. Both are illustrated with maps. The same number has a note on the observation of the last phase of the Transit of Mercury at the Observatory of Ebro, May 8, by Father L. Rodes. The November number contains maps of the eclipse of the sun of Jan. 25, 1925, by Father Wm.F. Rigge S.J.

The ASTROPHYSICAL JOURNAL for Sept., 1924, has a review of Father Hagen's "Die Veraenderliche Sterne, I Band, Geschlich-Technischer Teil". The reviewer states, "Part I, treating of the instrumental equipment of the Observer, was reviewed by the writer in this Journal, xl, 483, Dec., 1914. Whatever was there said in regard to the need of this work, the skill exhibited by the Author and the success of his efforts applies equally to the three parts here reviewed...." He adds that the book can be obtained from B. Herder Book Co., 17 South Broadway, St. Louis, Mo. The four parts cost 13.00. The price of each of the first three is 2.70, and of the fourth 4.90.

The CATHOLIC WORLD for Nov., 1924, among the articles included under the caption "The Ball and the Cross", has one on "The Work of the Jesuits at the Astronomical Observatory of Zi-Ka-Wei". It is based on an article of Jean Brunhes of the College de France in the REVUE D'HISTOIRE DES MISSIONS for June 1, 1924.

The Physics and the Mathematical Bulletins of the Central States Division of the Jesuit Scientists' Association are maintaining their

high standards. There seems no lack of contributors and the articles and notes are full of interest. We note an article in the December *Mathematical Bulletin* on "Rational Fractions Expressed as Decimal Fractions", by Father L.O. Phillips S.J., of Woodstock.

One of our readers in the Near East, Father Charles Neyron of the Province of Lyons, attached to the Faculty of Medicine at the University of St. Joseph conducted by our Lyons Fathers at Leyrouth in Syria, sends us a reprint of an article he contributed to the "*Bulletin de la Societe de Chimie Biologique*", entitled "Sur la recherche du sang par la solution alcoolique de gayac".

NOTES.

FATHER TONDORF'S WORK IN SEISMOLOGY.

The *SCIENTIFIC AMERICAN* has a page entitled "Here and There" which contains notes on men who have accomplished something of importance in the scientific world. The November number has an appreciation of Father F.A. Tondorf's work in seismology at Georgetown University with a characteristic photograph representing him beside his recently installed new seismograph. It speaks of the great distinction achieved by Georgetown in recording earthquakes, the responsibility for which is accredited to Father Tondorf. It also states that "our readers will probably realize that most of the items which they see in the daily press with reference to observations of earthquakes so many miles out to sea in this, that or the other quarter come from Washington and have been made with the Georgetown apparatus". We all know that Father Tondorf has been a pioneer in this important work and that he founded the Georgetown station and has given it a high reputation. Congratulations.

FRENCH JESUIT HONORED.

SCIENCE for November 7, 1924, among its scientific news and notes states that Dr. F.B. Berloty, director of the Asara Observatory in Syria has been elected a corresponding member of the French Academy of Sciences in the section of geography and navigation in the place of P. Colin. Dr. Berloty is one of Our Fathers of the Province of Lyons. The observatory belongs to this Province and is situated at Asara, one of the stations of the Mission of Syria in charge of the Province. P. Colin, who died in May 1923, is Father Elie Colin of the Province of Toulouse who became famous for his scientific work in Madagascar. He was the founder of the Observatory of Tananarive in Madagascar.

A BIOLOGICAL NOTE.

Mr. G.J. Shiple S.J. of Woodstock sends us the following note:-
 A very timely article, of interest not only to the biologist but to scientists in general as well, occurs in *SCIENCE* for Nov. 7, 1924, p. 419, by R.M. Oslund, entitled "Vasectomy and Rejuvenescence". There is a popular notion afloat that some most wonderful rejuvenating effects are a sure result of vasectomy. The author of the article in *SCIENCE* sums up the work that has been done in this connection and sifts the evidence very carefully. He then concludes as follows:- "The theory of rejuvenescence at present is based upon a necessary interstitial cell hypertrophy. Ligation of the vas deferens does not produce such hypertrophy. Vasectomy, therefore, cannot be looked upon as a method of causing rejuvenescence".

LECTURES BY FATHER AHERN.

Father M.J. Ahern S.J. of Holy Cross College writes as follows:-

It may interest the readers of the Bulletin to know that I have been invited to be one of the speakers of a group of sixteen that is to give a series of sixteen lectures, each speaker to give one, on sixteen successive Thursday afternoons during the winter at M.I.T. The general subject is "Recent Developments in Science", under the auspices of the Graduate School of Chemistry of the Institute. At their request I will speak on "Observations of a Scientist-Theologian on Evolution". Also I am to speak at a dinner meeting of the Boston Ethical Society some time during the winter in a symposium on "Science and Religions". At this meeting there will be a Protestant Modernist, a Protestant Fundamentalist, and a Liberal Protestant to give their views on the same subject. The Cardinal willingly gave his permission. My friend Professor Barton is the Chairman of the Board of Trustees of the organization. Hence the invitation.

NOTES FROM GEORGETOWN.

Mr. V.A. Gookin S.J. of Georgetown sends us the following notes:-

Mr. Joseph A. Muldoon (Ph.D. Fordham) is giving lectures in Analytical and Organic while Father Coyle is busily engaged in other work. Our Chemical Society continues its course and while small is thriving. Father Coyle was elected first President of the Chemistry Teachers' Association of the District of Columbia. About forty five members make up the organization. Father Coyle is Chairman of the Committee of the National Research Council which is collecting and comparing the plans of chemistry buildings all over the country.

A number of Ours attended the sessions of the Convention of Teachers of Colleges and High Schools in the Atlantic States held in Washington November 28 and 29. The Chemistry Section was interesting. A paper on the "New Type of Chemistry Texts" was read bringing up the advantages of the one word answer over the essay type of examination. The first type calls for "yes" and "no" and similar answers. Thus ten times the ordinary number of questions can be asked. Most of the teachers who took part in the discussion favored the mingling of both types of questions. Another paper was read which might be discussed with profit in the pages of the Bulletin. It was entitled "The Teacher and His Relation to Research", and was read by a man from the Bureau of Standards who is engaged in research after eight years of teaching chemistry at the University of Penn. His argument was that teaching and research are two distinct fields, so that if we want to be good chemistry teachers it would be better to keep out of research work. Some one present gave examples of two or three good teachers who are also doing good research work, but the speaker replied that such cases are happy exceptions. Perhaps our readers can find where to stand on the question.

Another interesting point, and a curious one, was brought out in a meeting of the Washington Chemical Society. There are 15,000 teachers of chemistry in this country who are not members of the American Chemical Society. The editor of the Journal of Chemical Education sponsored this statement. It reveals the fact that there are many teachers who probably fail to keep up with chemical literature or to attend meetings. Possibly distance from centers forbids the latter but subscription to Journals is possible even out in the "great open spaces". It is a strange and surprising fact.

CONGRATULATIONS FROM CHINA.

The Bulletin was glad to receive a word of congratulation from Father M. Vittrant of the Aurora University at Shanghai, China. He writes: "I congratulate you on this very useful and meritorious enterprise". Father Vittrant belongs to the Province of Paris and is Professor of Physics at the University conducted by his Province at Shanghai. We hope to receive a contribution from him some day.

A CONTRIBUTION FROM SPAIN.

Mr. P.R. Yancey S.J., now in theology at Ona, sends us the following interesting notes:-

In the last number of the Bulletin before the summer vacations the hope was expressed that some of Ours would attend the Madrid meeting of the International Geodesic and Geophysical Union. The following notes taken from our scientific weekly "Iberica" may be of interest to the readers of the Bulletin.

Besides Father Phillips, who was able to attend only a couple of the meetings of the Section of Geodesy, there were present at the Congress Father Rodes, Director of the Observatory of the Ebro, Father Sanchez Navarro, Director of the Observatory of La Cartuja (Granada), and Father Descotes, Director of the Observatory of La Paz, Bolivia. The latter was the official representative of the Bolivian Government. All of them were well received by the Congress and gave a good account of themselves and of the work of the Society in the scientific field. When the members of the Congress were received in public audience by the King and Queen, Fathers Rodes and Sanchez Navarro were singled out by their majesties for private talks, in which the King told them that when Very Reverend Father General visited him he told his Paternity not to miss seeing the two observatories of the Society in Spain.

Though not present at the Congress, Father Gherzi, Director of the Observatory of Zi-ka-wei, through Prof. Rothe, proposed the adoption of letters to designate the nature of the first wave in seismic disturbances: a "c" in the case of a wave of condensation, and a "d" for a wave of rarefaction. He also suggested the words "Anasist" and "Allosist" to signify the curves that contain impulses in the same or different directions respectively. Both proposals were unanimously adopted by the Congress and a vote of thanks was sent to Father Gherzi for these suggestions and also for his excellent work in seismology.

After the termination of the Congress the delegates visited various places of interest in Spain, quite a number taking in our Observatories of the Ebro and Cartuja. The latter place was visited by Prof. Reid of Johns Hopkins. He and other seismologists took great interest in the new Bellarmine (Gallitzen type, vertical, magneto-photographic) seismograph made by Br. Anthony Sola in the workshop of the Cartuja Observatory, and some even expressed a desire to place an order for a similar machine, but were refused.

Dr. L.A. Bauer of the Carnegie Institution of Washington, Head of the Section of Magnetism, paid a high tribute to the work in this line of the Observatory of the Ebro, in his Presidential Address. This is not the first time that Dr. Bauer has praised the work of the Ebro Station, for he did the same in an article in "Terrestrial Magnetism and Atmospheric Electricity Journal", last year.

NOTE. Don't forget to send a contribution to the Bulletin during 1925.

THE BULLETIN WISHES ALL ITS READERS
A VERY JOYFUL CHRISTMAS SEASON AND A HAPPY NEW YEAR.

