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PROFESSOR DRIESCH ON VITALISM.

On Feb. 28th. Professor Hans Driesch of the University of Leipsig who had been lecturing at various American Universities gave a lecture on the Philosophy of Organisms before Juniors and Seniors, Faculty, public etc. at Holy Cross College, Worcester Mass. The following brief abstract of the lecture was kindly sent to us by Mr. A. MacCormack S.J. of the Biology Dept. of Holy Cross College. Professor Driesch is Exchange Professor of the University of Wisconsin. His lecture was given under the auspices of the Biology Dept. and the Mendel Club. Some of the Professors from surrounding colleges and Universities were able to accept our invitations.

("The main body of workers attacked the problem of development from the egg....For this movement a dashing leader arose in young Driesch, a brilliant investigator and analyst. Analytical experimentation, he proclaimed, is the one and only possible way of salvation for biological science; the one and only way of getting that knowledge of the causes of things which constitutes science." H.S.Jennings, Biology and Experimentation).

Until 1890 the theory of epigenesis in embryology had been accepted as probably the correct explanation. The opposing theory, claiming that development is more or less similar the unfolding and growth of a bud into the adult structure, that the egg contains a preformed organism, had fallen into disuse. Epigenesis was, in brief, the transforming of a simple structure into one more complex, this in turn developing into a still more complicated structure or "manifoldness developing from oneness".

Weismann now brought out a theory resembling the old "evolutio" theory but less crude. He claimed the egg had a complicated organized structure, it contained something that in all its parts and relations corresponds to all the parts and relations of the future adult. Development was controlled by this arrangement.

Wilhelm Roux experimented to see if this could be proved. The first step of a developing egg is to divide into two cells, known as blastomeres. He punctured one of these two cells in the developing frog's egg by means of a hot needle. His result was a typical half embryo, almost as if a complete one had been divided by a razor. This certainly was a proof of "evolutio", one - half a frog from one - half the egg.

In 1891, Driesch decided to experiment. Since the organism known as the sea - urchin can stand rough handling, he chose it for his subject. By shaking up the developing egg, he separated the two blastomeres. Instead of one - half forms, he found small but whole forms, gastrula, pluteus, (larval - form). In normal development, the two blastomere stage becomes four blastomeres. He found that if this stage were broken up, from one of the four cells, any one of the four, a small but whole form developed. If three of the four cells were left together, same result Manifestly this contradicted Roux's results.

Even if the parts of a developing egg were shifted or changed yet it developed into a whole organism, which was not according to Weismann's theory.

Furthermore even if the egg was not broken up, but the relations of the cells one to another changed, a whole organism resulted. Driesch put the egg between sheets of glass, and used pressure sufficient to deform the cells, to shift them from their normal place. Here he changed the relations extremely, yet a normal organism resulted. (Fig. 1).

These results lead him to experiment in regard to regeneration, which was admittedly a weak point in Weismann's theory.

His observations led to his "harmonious equipotential" system. For he found that in the gastrula stage any number of cells, anywhere, could be cut away and yet the embryo developed into a typical one, smaller than the normal. (Of course, too many cells could be cut away). This means the prospective value of any element, (the cell in this case), certainly depends on, is a function of, the absolute size of the actually existing system (here the embryo). In other words, the cell may belong to any part of the organism, its ultimate fate differs according to the growth of the embryo. It is not a mechanical part fitting in only a certain place. In fig. 2, X forms part of three systems a - b, a" - b"; a' - b', its prospective value different in each.

In the ascidian *Clavellina*, the organism mainly consists of two parts, the branchial apparatus and the intestinal sac. If these two separated from each other, each may regenerate the other in the typical way by budding processes from the wounds. However the branchial apparatus may lose all its organization and become a small white sphere. After period of rest a new organization appears, which is not a branchial affair but a very small complete organism, an ascidian. Again if you isolate the branchial apparatus and cut it in two in any direction, often these two sections go through the same process as above, resulting in two complete little ascidians. In other words, the branchial apparatus is capable of changing into a complete organism by the co-operative work of its cells even each part by the same work may be transformed into a complete whole. (Cf. fig. 3).

In summing up, the impossibility of a mechanical explanation for these changes, as declared in Weismann's theory, was clearly shown. For a typical machine cannot remain itself if you rearrange parts at will, or if you remove parts.

To adequately explain these, Driesch held that vitalism was the only explanation. He called this principle an entelochy, not however in the Aristotelian sense. Entelochy was used as a mold into which he poured his meaning, namely a principle of "wholeness" or "oneness".

THE ENDOCRINE GLANDS AND THE TEETH

Studies in the chemical effects caused by the secretion of the endocrine glands have led to the relation of these glands to the teeth. It is hoped that these effects will not only be known in terms of physiology and pathology but will also lead to better treatment and perhaps prevention of dental disorders. A summary of some of the findings will be of interest.

The teeth depend upon calcium salts for their proper formation hardness and density. Calcium phosphate is in the largest proportion. A lack of it followed by incomplete formation of the enamel, particularly at the fissures on the upper surface of the molars and bicuspids means early decay and suffering. Some times one sees them doomed to the forceps before the roots have been completed. The calcium metabolism is controlled by the hormone of the parathyroids. The connection is evident. Studies of children between the ages of 4 and 10 who show a tendency to thyroid deficiency or rather a disturbance in thyroid equilibrium show marked dental disorders. Delayed dentition, mottled or irregularly calcified enamel and zonal caries or decay are found. In cases of marked delay in teeth eruption some improvement has been noticed in varying doses of thyroid gland. There are, of course, the necessary precautions, but these need not concern us now.

The relation of the pituitary gland to growth is well known its effects on the jaws and teeth are strange. The maxillary sockets become too large in some cases of change in pituitary equilibrium and loss of tooth follows independent of any decay. Another strange effect is, the upper front teeth are prominently associated with the pituitary function, their size and spacing being most readily affected. The effect of highly active adrenals is another strange one. The grinding surfaces show a marked reddish brown discoloration. The teeth are softer than thyroid or pituitary teeth but are found to have a greater degree of endurance. The discoloration reminds one of one of the characteristics of Addison's disease, the bronzing of the skin. This discoloration indicates long tooth life despite even abraded surfaces.

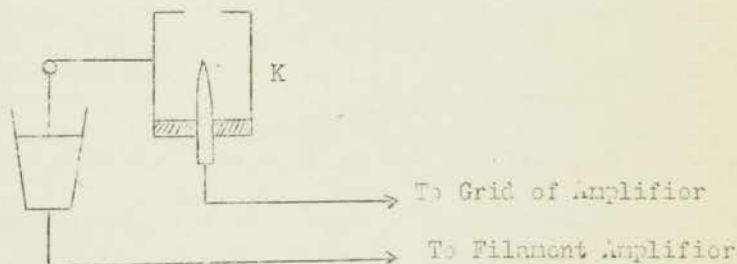
This summary indicates how varied are the influences of these glands. The material is new, and the observation require more checking up, study and interpretation. But science is long, the field is new, and it holds out well founded hopes of for something in the relief and prevention of suffering.

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AUDIBLE ATOMS

In Vol. II No. 3 (Jan-Feb. 1935) of the Bulletin the writer described a home-made apparatus of Fr. Wulf for making the alpha particles visible (more correctly the paths of the particles). Fr. Wulf has now devised the following simple method of making the alpha particles audible.

Using the principle that an alpha particle in virtue of its terrific speed ionizes the air (or any gas) through which it passes, he causes the discharge of these ions to pass through the amplifying circuit of a loud speaker. The amplifier and loud speaker are those of an ordinary radio set and will not be described.



K is a Geiger needle chamber - a small metal cylinder about $\frac{1}{2}$ inch dia., $\frac{1}{2}$ inches high, with a needle (gramophone needle works best) led through the centre of an insulated base (bakelite, wax etc.) The top of the cylinder can remain open, or, to keep out dust, may be covered with a very thin strip of tin, aluminum etc. The needle is connected to the grid of the amplifier. The side of the cylinder is connected to the inside of a leyden jar, the outside of the jar going to the filament of the amplifier. The leyden jar (or condenser) is charged from a Wimshurst to about 3000 volts. If radium preparation is now held a few cms. over the needle chamber alpha particles will emanate from it into the chamber and "Static" will be heard in the loud speaker. If the radium be raised slowly so that alpha particles enter the chamber singly, each entrance will be announced by a static grunt in the loud speaker. As each particle enters the chamber, the air is ionized and a discharge takes place at the needle point. All ions of one charge rushing to the sides of the cylinder to give up their charge are, the charge being heard in the loud speaker.

Note: Father Lynch writes that Father Wulf demonstrated the experiment in a recent lecture on the "Structure of the Atom" at Bachen in Germany.

Fr. J. Lynch
Ignatius-Kollog,
Valkenburg.

THE SPRING MEETING OF THE AMERICAN CHEMICAL SOCIETY

The spring meeting of the American Chemical Society was held at Richmond, Va., the week of Apr. 10 and was very well attended. All the members we talked to were enthusiastic about the city and all agreed that the proverbial southern hospitality was a reputation well deserved. So far as we heard, no very startling papers were read, but many of them were valuable contributions to the science and many useful points were brought out in the discussions. The papers read before the Division of Chemical Education for instance might be classified (as to their subject matter at least) somewhat as follows:

Good	25%
fair	75%
Awful	25%

As regards presentation, it would be safe to say that most of the speakers would have been benefited by a good course in philosophy or in Canon Law. Clear, simple, and direct exposition was rare, and several found difficulty in stopping when they had finished what they had to say. If a speaker gets up at any of these meetings, even though he has only a very modest contribution, but "puts it over" in a direct convincing manner, supported perhaps by a few, simple, clear-cut slides, he will stand out so conspicuously as to be one of the most popular members of the Division. Nothing that we could say on this whole matter could be more appropriate than were the few words of Dr. Glessen addressed to the Educational Division at its last meeting, when in his usual felicitous manner he forced all the brethren and sisters to laugh at themselves as types of the sort of speaker he portrayed who lectures in an inaudible voice on a most stupid subject supplemented by abominable slides projected from a lantern which does not work; who over-estimates the information of his hearers as regards the subject under discussion, but who under-estimates their intelligence, and who gives evidence in general that he is one of those savants who are engaged in "knowing more and more about less and less".

Our chemistry teachers will be interested to hear that the growing tendency to teach the whole subject from an electronic viewpoint is not unanimously approved of by outside teachers; Dr. Brautlecht of the Univ. of Maine was one of the leaders of the more conservative group. They will not however be suprised to learn that their outside colleagues are not yet entirely free from drawing an occasional conclusion unsupported by the numerical data at hand. They will do well to form opinions and to be prepared to defend their views on such subjects on such questions as

Should chem. classes be sectioned on a basis of scholarship?

Should a distinction be made in college chem. classes between the students who have had high school chem. and those who have not?

Should the lectures in general chem. be accompanied by through demonstration, or by no demonstration?

They will also do well to note down any reference they may see to any pioneer work in chem. either done or recorded by our missionaries, as this may come in handy for a paper sometime before the section on the History of Chemistry.

Dr. Meldrum's paper on Qualitative Analysis in the General Chem. course and Dr. Gay's paper on a new departure in teaching volumetric analysis was both excellent and should be read carefully when they are published. The paper of Dr. Clarke of the Eastman Laboratory on Laboratory Technique in Org. Chem. was most instructive and will be reported on later in detail.

Fr. Niewland of Notre Dame, although he had just come from the hospital, was as usual very active in the meetings of the section on Organic Chemistry, and had three papers up for presentation. Fr. J.J.Sullivan's work on the separation of the tautomeric forms of acetoacetic ester at Johns Hopkins was made the subject of a preliminary report by his professor, Dr. F.O.Rice. Fr. Coyle as Chairman on the National Research Council's committee on the construction and design of chemical laboratories was naturally kept very busy conferring with other members of the committee, since the N.R.C.'s monograph on this subject which he is preparing is now getting into shape for publication.

Besides Fr. Coyle and Fr. Niewland, the clerical delegation also included Fr. Hohman of Boston Colloge, Fr. Sullivan of Johns Hopkins, and through the kindness of Fr. Provincial and Fr. Rector, Messrs. McCullough and Power of Woodstock.

Mr. F. Power,
Woodstock Colloge.

FR. WULF'S NEW TEXT BOOK OF PHYSICS

In the last number of the Bulletin mention was made of Fr. Theodor Wulf's Lehrbuch der Physik recently published by Herder & Company of Freiburg. One of the author's predecessors in the chair of physics at Valkenburg, Fr. L. Dressel, published an excellent text some thirty years ago. It had been revised by Fr. Paffrath and as it was out of print the publishers wished to get out a new edition. The science of physics has however made such marvelous progress during the past quarter of a century that it was deemed advisable to write an entirely new text in which the modern view point of the atom and of atomic structure which now dominates the field of research would occupy a prominent place. The law of the conservation of energy upon which many of the older texts were built up has not lost its importance. But it does not tell us enough of the "how" and "why" of things. It does not concern itself with theories about the structure of matter. In our own time radio-activity, the electron and quantum theories etc., have made great progress and physicists now see that the world of the atom which has been revealed in such a wonderful way must contain the key to many of the mysteries of nature. We must look therefore more and more to the atom and its constituents to explain physical phenomena and laws. As Fr. Wulf says in his preface, "The deduction of the phenomena from the inner structure of the smallest constituents of bodies is regarded as the proper and ultimate purpose of physics". He has kept this view point in mind in writing his book and he is to be congratulated upon the success of his effort to present a comprehensive exposition of the fundamental achievements of the science of physics.

The book is a compact volume of about 500 pages. There are very few illustrations but a fair number of diagrams which bring out the point as well as, an often better than, a picture. Two things strike one in reading through the text; its clearness and its distinctly modern and up to date manner of treatment. This treatment it may be remarked is not merely descriptive but also critical. Evidence is weighed as well as merely explained. The difficulties which have arisen in connection with theories such as the quantum theory and various theories concerning the ether are set forth without any attempt to minimize them while at the same time due credit is given to the theory themselves for their achievements. The reader thus realizes that physics is not yet a finished science but has many outstanding problems for whose solution we must look to the future.

The book is divided into four parts. The first, "Die Korperwelt" or ("world of material bodies") deals with the fundamental concepts of motion, the motion of bodies, gravitation, elasticity, wave motion and sound. Under motion the author introduces and illustrates the difficult concept of the time coordinate of a body in connection with the four dimensional space time continuum. The idea of potential is introduced in connection with gravitation as is quite fitting and then linked up afterwards with electrostatics.

Sound is treated quite briefly in about sixteen pages. Part two "Der Aufbau der Körperwelt aus Atomen" or (the atomic structure of material bodies") takes up the system of elements, the atoms and their constants with isotopes and in addition the gaseous, liquid and solid states together with heat and thermodynamics. With the exception of two or three short equations thermodynamics is treated non-mathematically. This subject which ordinarily presents many difficulties to the student is treated in a very clear and interesting manner. The philosophical aspects are also kept in mind. The validity of the first law is discussed at length and its application to living beings is also considered. As is well known the subject of entropy is usually treated briefly or not at all in the ordinary texts. To the ordinary student it frequently appears as a mathematical abstraction. At best it is difficult to visualize it. To tell him that it is a property of a body which remains constant during any reversible process but changes by an amount H/T when the body passes from one adiabatic to another does not help him very much. Fr. Wulf devotes thirteen pages to the discussion of entropy and the law of entropy or the second law of thermodynamics. The treatment is out of the ordinary and is one of the clearest we have seen. He leads up to it by an explanation of positive and negative processes and distinguishes three classes of energy. He discusses the internal mechanism of entropy and gives Boltzmann's explanation. The lengthy discussion of the Carnot cycle which one finds in most texts is not given. There is a discussion of Nernst's Third Law of thermodynamics which is rarely found in our ordinary texts. One has to look for it in some work on physical chemistry.

Part three "Der Aufbau des Atoms" (the structure of the atom") deals with ions electron and atomic nuclei, electricity and magnetism, radioactivity and electromagnetic waves. In connection with the latter the quantum theory and the problems connected with it have a prominent place. There is also an excellent critique of the newer radiation theories. Part four, "Physik des Aethers" ("the physics of the ether") includes optics and a discussion of the ether, its existence, properties Fizeau and Michelson experiments and the bearing of Einstein's relativity theory on the ether.

It will be readily seen that in a book of 500 pages which contains so much of the modern physics many topics treated in American texts and in our colleges courses are omitted or very briefly treated. There are few references to everyday applications of physics. Where the student has already had a preparatory course in physics this is not a serious difficulty. Otherwise the professor would doubtless be inclined to add some subject not treated. A limited number of formulae are given and these are treated briefly. It may be added that the historical notes add much to the interest of the book.

CELEBRATION OF FATHER HAGON'S EIGHTIETH BIRTHDAY IN ROME

In our last issue we stated that Father John G. Hagon had received a medal from the Holy Father in recognition of his achievements in astronomy. We also quoted an article in "Variable Comments" by Mr. D.B. Pickering describing his visit to the Vatican Observatory. We supposed at the time that as the article appeared in the journal of the American Association of Variable Star Observers" it would not receive any further publicity. By a coincidence however Mr. Pickering published it in somewhat different form in Popular Astronomy for April 1927. He includes a picture of Fr. Hagon at the Vatican Observatory. Since then the press and various publications have given appreciative notices of Fr. Hagon in connection with the recent celebration of his eightieth birthday. The New York Times among others gave his portrait at his telescope. "Aus der Provinz" the News Letter of the German Provinces in its March issue gives an account of the birthday celebration in Rome which may interest our readers. We quote from it as doubtless there are some who will not have an opportunity of seeing it.

On March 6th of this year Fr. Hagon the astronomer of the Vatican Observatory completed in Rome his eightieth year. Neither the Vatican nor the Biblical Institute to which he is attached neglected to celebrate the event in a simple but fitting manner.

On the preceding day the Holy Father sent a telephone message to the observatory asking if he might pay the jubilarian a brief visit. He set 4.00 P.M. as the time. Upon going to the garden at this hour Fr. Hagon found there the Maestro di Canora, Cardinal Gasparri, Secretary of State, Cardinal Ehrle and other distinguished visitors who expressed to him their good wishes. Shortly the car of His Holiness arrived. The Pope and the other visitors engaged in familiar conversation with him while strolling about the garden. The Pope then drew from his pocket a case containing a medal (6 cms wide and 3 mm thick) especially struck for the occasion. On one side there is a likeness of Pius XI and on the other the inscription,

Astronome Clariss / Joanni Hagon / Societatis Jesu /
 Praef. Speculac Vat. / LXXXAnnos / supergresso /
 feliciter / prid. Non Mart. / a.M. DCCCCXXVII.

The walk finally led all to the Lourdes Grotto and also to the parrot and angle which are fed daily by the Holy Father. The visitors departed after about two hours. This honor and particularly the simple manner in which it was bestowed pleased Fr. Hagon very much. That it did not disturb his peace of mind in the least was shown by the fact that he was back at his work that very night and finished a chapter.

On the following noon the Biblical Institute sent a car for Fr. Hagon for a little celebration in the family circle. Cardinal Ehrle, the German Assistant Fr. van Opponraaji, the profect apostolic of the Zambosi Mission Fr. Brown and various German fathers from our houses in Rome were present at the dinner. During the recreation after dinner Fr. Fonck read the diploma by which the Catholic Theological Faculty of the University of Munster conferred upon Fr. Hagon, "qui in alma nostra Academia, Eduardo Heis Magistro, astronomian doctus, in contemplantis et describendis coelis, enarrantibus gloriam sapientissimi universorum Conditoris, ad ipsius Dei gloriam Ecclesiaeque honorem vitam integram consumpsit, Summus in sacra theologia honores Doctorisque gradum, jura ad privilegia honoris causa." Great were the applause and joy of the brethren at this well deserved honor. His Eminence Cardinal Ehrle then made an address in which he pointed out how really great Father Hagon's services to the Holy See have been. Very Reverend Father General also paid the Jubilarian a special visit to express to him his good wishes.

May the venerable father who is still so active mentally and who carries on his observations on every cloudless night (which are more numerous in Rome than at Valkenburg) be granted a long and beautiful evening of life. "This we are sure is also the prayer of the readers of the Bulletin. The latter also takes this opportunity to congratulate the great astronomer who spent so many years in our Maryland New York Province upon his great achievements in his beloved science and upon the well deserved honors which have been conferred upon him on this happy occasion.

FATHER F. TONDORF A FELLOW OF THE ROYAL ASTRONOMICAL SOCIETY OF LONDON

The Georgetown Journal for April contains a letter dated Burlington House London February 11th 1927 and signed by J. Jackson Secretary which informed Father F. Tondorf that he had on that day been elected a Fellow of the Royal Astronomical Society of London. It is gratifying to note that work of Georgetown's veteran seismologist in the advancement of science is receiving recognition in Europe as well as in America. The Bulletin which is indebted to him for frequent cooperation congratulates him on the high distinction which has been conferred upon him.

MEETING OF THE AMERICAN GEOPHYSICAL UNION

The American Geophysics Union whose purpose is "to promote the study of problems concerned with the figure and physics of the earth, to initiate and coordinate researches which depend upon international and national cooperation and to provide for their scientific discussion and publication held its eighth annual meeting at Washington D.C. on April 28th and 29th. Several of Ours attended. Fr. Tondorf was a member of the committee on resolutions of which Professor Marvin, Chief of the U.S. Weather Bureau was chairman.

Reports of progress in seismological work in the United States were made by the Carnegie Institution of Washington, the Jesuit Seismological Association and the U.S. Coast and Geodetic Survey. Fr. James represented the Jesuit Seismological Association. He also read a paper on "Some new wave groups observed on the records of the South Pacific Earthquake of June 26th, 1924. Georgetown University and the Smithsonian Institution took part in the seismological exhibit displaying the following: Photographs, paintings, instruments and models showing development of the seismograph:

- 1) First Seismograph after Choko, A.D. 136.
- 2) A painting of the ancient dragon-frog seismoscope.
- 3) De. Haute Fouille seismoscope A.D. 1703 (first improvement on Choko's machine)
- 4) A simple mantle-type tremometer to show slight earth tremors.
- 5) One of the early seismographs constructed on modern principles.
- 6) A model of the famous "Sekiya's wires" showing the actual path of an earth particle during an earthquake.
- 7) Vertical seismograph of Galitzin operated at Georgetown.

Seismograms recorded by great earthquakes.

- 1) Japan, September 1, 1923 record at Tokyo.
- 2) Sumatra, June 28th, 1926, record of vertical seismograph at Georgetown.
- 3) Saguenay Basin, Canada February 28th, 1925, record at Georgetown and showing possible cause of misinterpretation.
- 4) Heavy microseismic disturbance recorded at Georgetown.

PUBLICATIONS

Popular Astronomy for April 1927, has an article by Fr. M. Solga, Director of the Observatory and of the Weather Bureau at Manila on "Astronomical and Meteorological Conditions of the Eclipse of the Sun May, 9, 1929 in the Philippines". This eclipse which will be of great interest to ours in the Islands will take place in the middle of the afternoon the maximum length of totality being five minutes seven seconds. Manila is not in the path so it will only be partial there. Fr. Solga has made a study of weather conditions in May through the region of totality in past years according to the records of the Weather Bureau. He states that the towns of Iloilo and Cebu offer the best opportunities for prospective observers. The Scientific American for April 1927 has an article on Father Riggo's Harmonic Motion Machine. A picture shows the machine with its inventor and constructor seated beside it.

The "Katholischen Missionen, a Monthly edited by our German Fathers has an article in its March number by Fr. G. Lehmacher S.J. entitled "P. Licent S.J., der grosse Forscher-Missionar". It describes the remarkable explorations carried on for the past thirteen years in China by Fr. Licent of the Province of Paris. He published an account of his work in 1924 in a book of some 1700 pages with 154 maps and over 3000 illustrations entitled "Dix Années de Séjour et d'exploration dans le bassin du Fleuve Jaune et des autres tributaires du golf de Petchou-ly." With Tientsin as headquarters he travelled over 30,000 kilometers. Extensive collections of fossils stone implements and other ethnological specimens, woods, birds etc., were made and are now in the museum founded by Fr. Licent at Tientsin. Many specimens were also sent to Europe. Fr. Teilhard de Chardin the geologist whom we have mentioned from time to time has been associated with Fr. Licent in his researches. In a recent letter dated at Tientsin he writes to acknowledge with thanks the receipt of the Bulletin and to inform us that he returned to China this year to continue his geological researches in Northern China and in Mongolia.

The Georgetown Journal has an article by Fr. Tondorf entitled, "Father John G. Hagen S.J., An Appreciation". It brings out in particular the veteran's astronomical work at the Georgetown Observatory.

The Bibliographical Bulletin of the Eastern Section of the Seismological Society of America, besides giving abstracts of the papers read by Fathers Macelwane and Repettl at the Philadelphia Meeting of the American Association for the Advancement of Science, also contains the following reference. Navarra, P. Manuel M. Sanchez, S.J. "Los Terremotos y sus Efectos" Iberica, Nos. 647-648 Oct. 9-16 1926.

It also has the following note: "For some years past an important contribution to seismological records has been made by Father Tenderf of Georgetown University Washington D.C. in the form of monthly publication (in connection with the regular bulletin of his station) of his compilation of press dispatches dealing with earthquakes".

DEATH OF FR. WM. F. RIGGE

Our readers have doubtless received by this time the news of the death of Fr. Wm. F. Rigge the astronomer of Creighton University at Omaha. Popular Astronomy for April says that during his directorship of the Creighton Observatory for about thirty years "he was a frequent and valued contributor to these pages, and at present we have a manuscript by him to be published in the May issue. We personally feel the loss of an eminently capable and esteemed associate". R.I.P.

