

A. M. D. G.

BULLETIN

of the

AMERICAN ASSOCIATION OF JESUIT SCIENTISTS

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THE BULLETIN

With the present number the BULLETIN begins its third volume and it looks forward with confidence to another successful year. Though our subscription list has not grown very much, we have been adding to the number of our pages, thanks to the active interest of some of our readers. We count on similar cooperation from a larger group during the coming year. Our colleges all began their fall terms with record attendances, some in fact being obliged to turn away prospective students for lack of accommodations. That Jesuit education is in such demand must be a source of satisfaction to all of us. Such large numbers of students will necessarily engage in many college activities and we hope to chronicle some of their achievements in the line of science. If but one professor in each college would keep the BULLETIN in mind we could add greatly to the interest of its numbers this year.

During the summer the outstanding events of which we give an account in this number were the annual meeting of the Association and the organization of the Jesuit Seismological Association. This latter Association, which has been successfully started, promises to take an important place in the scientific world particularly in the domain of geophysics. With so many of our colleges, universities and observatories in different parts of the world equipped or about to be equipped with seismographs it has a unique opportunity of furthering and coordinating research in a science which is still in its youth and which is of great interest and importance. The Missouri Province Scientific Association met at Chicago during August and our own Association met at Holy Cross College, Worcester, Massachusetts, after the Summer School. A report of the BULLETIN and its work was made at our meeting. The theologians of Woodstock College have again consented to take care of the printing of this year's issues. The editor and the readers of the BULLETIN greatly appreciate their generosity. It is our duty to supply them with sufficient matter for their press.

HOLY CROSS MEETING OF THE ASSOCIATION.

On August 12th and 13th the Eastern Section of the American Association of Jesuit Scientists held its fourth annual meeting at Holy Cross College, Worcester, Massachusetts.

The success of the meeting was due in large part to the fact that very definite work was cut out for the meeting, notably the discussion and recommendation of a syllabus for the Province B.S. Course.

On Wednesday, August 12th, after the appointment of the various committees, Father M. J. Ahern, S. J., gave his Presidential address in which he laid emphasis on the fact that our opportunities for doing good were many because of the spirit of the times. It is a time when it is possible for us to show the scientific world that the Catholic Church alone can furnish the correct theological and philosophical basis for the solution of the problems of the day.

The remainder of the day was given over to the discussion of the B. S. syllabus. Previous to the meeting some of the members had outlined a B. S. course. This served as a starting point for the discussion. The syllabus was examined

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bit by bit, starting with Freshman and going through each subject until the entire syllabus was covered.

Thursday morning was devoted to the reading of the papers in the various sections, but at three o'clock the members again met for the reading of the revised B.S. course and the close of the meeting.

It was felt that the meeting had proven a success. For not to mention the profit gained from some excellent papers read in the different sections; such a discussion of the B. S. syllabus, in which the question was viewed from many angles and in which the opinions of experienced teachers were repeatedly given, could not give the members a very clear insight into the purpose of our science courses and the means of attaining that end.

But lest there should be all work and no play, those in charge provided a motion picture entertainment for each evening of the meeting. The pictures included several very good scientific films. Then, too, the Central Scientific Company provided an exhibit and demonstration of some new scientific apparatus.

The report and proceedings of the meeting will be published in the near future in the form of a separate bulletin.

The following officers were elected:-

General Officers: President, Rev. G. F. Strohaver.
Secretary, Mr. T. H. Quigley.

Section Officers;

Physics: President, Rev. J. L. Gipprich.
Secretary, Mr. T. L. McLaughlin.

Mathematics: President, Rev. E. C. Phillips.
Secretary, Mr. G. A. O'Donnell.

Chemistry: President, Rev. A. J. Hohman.
Secretary, Mr. H. J. Bihler.

Biology: President, Rev. C. E. Shaffrey.
Secretary, Mr. H. L. Freatman.

Mr. T. H. Quigley, S. J. Sec.
Holy Cross College, Worcester.

SCIENCE SUMMER SCHOOL.

The Science Summer School of the Province met again this year at Holy Cross College, Worcester, Massachusetts. The session began after Villa and continued during the latter part of July and the early part of August. Father A. C. Phillips was in charge and gave a course in Calculus. Father J. L. Gipprich took up a number of special topics with the professors of Physics, while Father J. S. Didusch directed the work in Biology. Fathers M. J. Ahern and G. F. Strohaver gave instruction in Chemistry. Through the good offices of Father Ahern a number of interesting scientific films were shown. The scholastics teaching literature in our various colleges carried on their summer work at Holy Cross at the same time.

NEW JESUIT SEISMOLOGICAL ASSOCIATION.

Father W. O. Repetti of Woodstock, and Mr. J. S. O'Connor of Fordham represented our Province at the important meeting of the Jesuit seismologists held on August 24th., 1925, at Loyola University, Chicago. We are able to print the following minutes of the meeting through the kindness of both Father J. B. Macelwane of St. Louis Univ. and Mr. J. S. O'Connor of Fordham, each of whom sent us a copy:-

The meeting was called to order about 9:30 A. M. by the Reverend William H. Agnew, S. J., Rector of Loyola University. The delegates present were Rev. Florence D. Sullivan, S. J., Rector of Loyola University, New Orleans, representing the Province of New Orleans, Rev. William C. Repetti, S. J. and Mr. John S. O'Connor, S. J., representing the Maryland-New York Province, Mr. James B. Henry, S. J.

representing the California Province, and Revs. William H. Agnew, S.J. and James B. Macelwane, S.J., for the Missouri Province. Eight others had been invited by their respective Provincials but were unable to attend. Father Sullivan, of New Orleans, was nominated as permanent chairman and unanimously elected. Father Macelwane was chosen permanent secretary.

The motion was made by Father Macelwane and unanimously carried that all the participating stations were to continue in their present autonomy and that nothing that was to be done by the meeting should be construed as limiting the freedom of any station to make use of its data just as the local authorities should desire.

It was furthermore decided that the meeting had no definitive authority; that its decisions were to be referred by the secretary to the American Provincials for their approval, and that another meeting was to be held next year to determine the final form of organization on the basis of this year's Experience.

Father Macelwane was asked to give an account of the circumstances that led to the call for the meeting by the four Fathers Provincial. This he did by presenting a brief resume of the paper he had read at the meeting of the Physics Section of the American Association of Jesuit Scientists on "Our Great Opportunity in Seismological Research" and by relating the incidents connected with the visits paid him in regard to the matter by the seismologists of the Carnegie Institution of Washington, especially by Dr. Arthur L. Day.

Father Sullivan spoke of the great advantages we already have in our chain of seismological stations and of how very much these would be increased by the proposed organization. He then asked several of those present to outline what they thought should be undertaken by a central station. The Two ideas advanced in some detail were:-

(1) A research center where scientific work of the first order could be accomplished; where directors of stations and other seismologists might find facilities for the solution of their own problems not available at home; and where, through connection with a graduate school younger men might prepare for work in this field.

(2) An administrative central station which would serve as a clearing house for information; where data would be gathered, collated, and distributed to the stations as soon as possible after each earthquake; whither the other stations could look for scientific assistance to any extent they desire; and which would serve as a medium of communication with outside organizations.

Mr. O'Connor, of the Maryland-New York Province, moved that, in as much as a research center had already been established at the St. Louis University by the creation of the new department of geophysics there, the Jesuit Seismological Association cooperate with it instead of establishing any other center at least for the present. The motion was carried.

Mr. Henry of the California Province moved that, whereas the administrative work of a central station could be done most scientifically and satisfactorily by a research personnel, also the administrative central station of the association be established at St. Louis under the direction of Father Macelwane. The motion was carried.

Then it was further moved and carried that the central station so established be considered as removeable at the discretion of the association; that it keep its separate identity and give impartial credit to all sources of information; that its title be "The Central Station of the Jesuit Seismological Association," and that all other Jesuit stations be empowered to designate themselves, each as "Member of the Jesuit Seismological Association."

A unanimous vote of thanks was tendered to Very Reverend Father McMenamy, Provincial of the Missouri Province, and to Father Cloud, President of St. Louis University, for their generosity in offering the facilities of St. Louis University for a central station.

It was moved and carried that the secretary send copies of the minutes of the meeting to each of the Fathers Provincial and to very Reverend Father General and to Father Mattern; and that, as soon as he had communicated with the Provincials, he send a letter to each of the Fathers Rector of the country telling them of the meeting and of its results and solliciting their cooperation; and that he draw up and submit to the single stations a tentative plan for their cooperation.

It was further moved and voted that the secretary use his discretion in giving information to the press of the country and in communicating with outside agencies, but that such information be always accredited to its proper source, either to the association as a whole or to any individual station which furnished it, according to priority.

A motion was also carried that the central station compile a brief bibliography to assist the stations in selecting a working library.

It was declared to be the sense of the meeting that research work at each of the stations be encouraged to the utmost; that records for this purpose; and especially that a copy of every important record be sent to the central station.

Father Macelwane described the negotiations he had been carrying on of correspondence with the principal seismologists of the world in regard to needed additions to our present international notation used in the publication of earthquake reports. The meeting voted to authorize him to publish the proposed additions as officially adopted by the Jesuit Seismological Association.

Besides the delegates mentioned above there were present Fathers David B. Hickey, S.J., of Creighton, and George J. Brunner, S.J., of John Carroll, and Messrs. Joseph Savoie, of Regina, James R. Gibbons, S.J., of Patna, and others who took an active part in the discussions.

The meeting adjourned a little before twelve o'clock.

Father Macelwane writes that the project has the hearty approval of all the four American Provincials. "We are all working together on this project and must pool our experiences to make it succeed A. M. D. G." He says that "the Department of Geophysics of St. Louis University is offering all its facilities to the central station, i.e. space, director's time, etc. Of course, all expenses connected with the operation of the department, with the installation and operation of a first class station with its initial equipment of five Wood*Anderson seismographs, or with any research project undertaken by the department will be borne by the University." Plans will be formulated later to meet the additional expenses of the association. Mr. O'Connor writes on Oct. 8, "I do not think there is much to add to the minutes except to emphasize the importance of the work Father Macelwane is undertaking. Commander Heck, head of the department of Seismology of the United States Coast and Geodetic Survey was here last week and spoke most highly both of the past work as well as of the new organizations of the Jesuit stations. He considers that the territory around such stations as St. Louis, Georgetown, Fordham, etc., is amply covered by our work, so much so that the Government does not intend to open any new observatories in these localities, although their new program calls for a net-work of stations embracing the entire United States. This is certainly an indication of the cooperation expected on all sides and an incentive to keep up an activity well begun." We hope to give some account of the activities of the Seismological Association in future issues of the BULLETIN.

SOME IMPORTANT DEVELOPMENTS IN PHYSICS DURING THE PAST YEAR.

Father C. E. Deppermann who kindly sent us the following article received his Ph.D. at Hopkins University, Baltimore, Md., last June. He spent part of the summer in Washington getting in touch with the scientific work of some of the Government Bureaus and of the Carnegie Institution. He then went to Mount Wilson Solar Observatory in California for special work in Astronomy. He found, however, that

he would be better able to get what he needed at the University of California. He went there towards the end of September. His present address is St. Ignatius College, 2130 Fulton St., San Francisco, California.

In the present state of physics it is rather risky to state definitely what are the most important advances during the year, for an experiment which may seem now to be of little importance may loom very large in the near future when it is better understood. However, some of the important advances seem to be the following:

Under the stimulus of the Bohr theory the classification of the line spectra of the elements, started by Balmer, Ritz and Rydberg, has grown apace, each year bringing new and interesting relations to light. Investigations in this field are important because they give us an insight into the innerstructure of the atom. For instance, during the past year, Millikan and Bowen (PHYSICAL REVIEW, March, May, August, 1925), continuing their work on the ultra-violet spectra of atoms stripped of all their valency electrons except one or two, have shown that atoms of various elements having the same number of valency electrons left in the outer shell possess similar spectra arranged in simple series. The series laws have been found to hold, as the element increases in atomic number, from lines from the extreme ultra violet and X-ray region up to the

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From the above we would expect neutral atoms of the 4th, 5th, etc., places in the above table to have 4, 5, etc., valency electrons and hence spectra of increasing complexity; the iron spectrum is of course notorious in this respect. Such spectra, because of their complexity, are extremely difficult to analyze, but even here much progress has been made recently. By patient comparison, and by use of the fact that the Zeeman effect is similar for lines of a definite spectral series, etc., Meggers and others in the Bureau of Standards, and one or two German physicists, have been gradually working out the series even in the most complex jumble of lines. (Cf. PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCE, January 1925, and others of the preceding half year; also several articles during the past year in the ZEITSCHRIFT FUR PHYSIK.)

Another interesting development has been the work of Mullikan on band spectra (Cf. PHYSICAL REVIEW, Feb., March, July, 1925, etc.) Just as single atoms give line spectra, so molecules give band spectra of seemingly unlimited intricacy and unlimited number of lines closely packed. Yet many have been found to be subject to quite simple laws. These laws are important because from them we can get a knowledge of the moment of inertia of the molecule and the atom, - a very important matter. Not only this, but Mullikan has shown that if one of the atoms of the molecule is isotopic we get two sets of bands closely similar and but slightly separated from each other, and from these we can get the atomic weights of the isotopes. The number and weight of the isotopes thus found agree perfectly with those found by Aston and Dempster with their mass spectrometers. Mullikan has been working with gases, but recently Pfund (Cf. J. OPTICAL SOC., lately) has shown that this isotopic effect can also be traced in the deep infra-red spectra of crystals, thus opening up another suggestive field for research.

So much for the atom. Let us now turn to the subject of relativity. The battle for and against relativity is still actively waged, and it looks at present as if the theory is being confronted with most grave difficulties, to which we will now briefly refer. Sommerfeld in his "Atombau" makes a great point in favor of relativity from the so-called relativity-doublet, and claims that the fine structure of the hydrogen and helium lines proves it. Millikan and Bowen however (Cf. PHYS. REV., latter half of 1924) working on the spectral

lines mentioned above, find that the application of relativity to the doublets leads to a very pretty dilemma. Lande in the ZEIT. F. PHYS. comes to the same conclusion. Again, most recent results for the doublet separation in the fine structure for the hydrogen lines are not those predicted by the relativity theory.

Nor is this all. America is again to the fore in two other attacks on the theory. In the ASTROPHYSICAL JOURNAL for April, 1925, Michelson reports on his experiment of sending light in opposite directions around a very large rectangle. The significance of the shift in light fringes obtained by Michelson is thus gauged by Jeans in a recent number of NATURE: It entirely negatives that common explanation of the relativity theory that denies an ether, and also consonant with the classical theory of a stagnant ether; hence it does not overthrow relativity. However, Miller has just published (Cf. NATURE, July 11, 1925) a preliminary report of a long series of experiments repeating the famous Michelson-Morley experiment, the backbone of relativity, which threaten if substantiated to destroy relativity utterly. Miller claims that his experiments show a real ether drift, which becomes rapidly less as altitude above sea level increases, and furthermore that the drift indicates that the solar system is moving towards a point in the constellation of Hercules, whither astronomers also hold we are moving. Silberstein (Cf. NATURE) confirms these interpretations of Miller's work, and insists that it spells the doom of relativity; he explains the lack of ether drift shown in Michelson's experiments above quoted by the fact that Michelson's work shows no rotational drag but does not touch the translational drag shown by Miller. Eddington has questioned Miller's and Silberstein's interpretation of Miller's results, contending that the facts of aberration are against it (Cf. NATURE), but Silberstein and others in a very recent number of NATURE seem to dispose of his objection. However, a decisive verdict will have to wait for a careful scrutiny of Miller's final and full report; until then it is best to keep an open mind on the relativity question.

Father C. E. Deppermann, S.J.

A BRIEF HISTORY OF THE MANILA OBSERVATORY. (Part I)

Mr. B. Doucette S. J. has kindly sent us an interesting account of the history and equipment of the famous observatory of the Society at Manila founded and carried on for many years by our Spanish Fathers. He was first stationed at Vigan where he taught physics. When our men were recalled from that city he was sent to the Colegio de San Jose in Manila where he is doing some teaching and giving the rest of his time with Mr. Toolin to private study in meteorology at the Observatory under the direction of Father Selga. He writes, "We have been working on temperature, rainy seasons, droughts and such things. I have also studied "Methods of Least Squares" and done some examples. I have been looking up in former numbers of the Monthly Weather Review everything that I can use in the subject of meteorology. I find that my knowledge of physics is the best preparation for this work. When I found that a theoretical treatment of meteorology involved adiabatic processes I felt almost at home." He says further, "The departure from Vigan was pathetic for the people. They were sorry to see us go. I enjoyed my "exile" up there for I saw many interesting things which I would not have had I stayed in Manila."

The Manila Observatory, founded in 1865, has constantly and faithfully given invaluable service to the Philippine Islands and the neighboring countries by its predictions and warnings of typhoons. When one experiences the destructive effects of a typhoon, even after three days are given to prepare for it, he realizes

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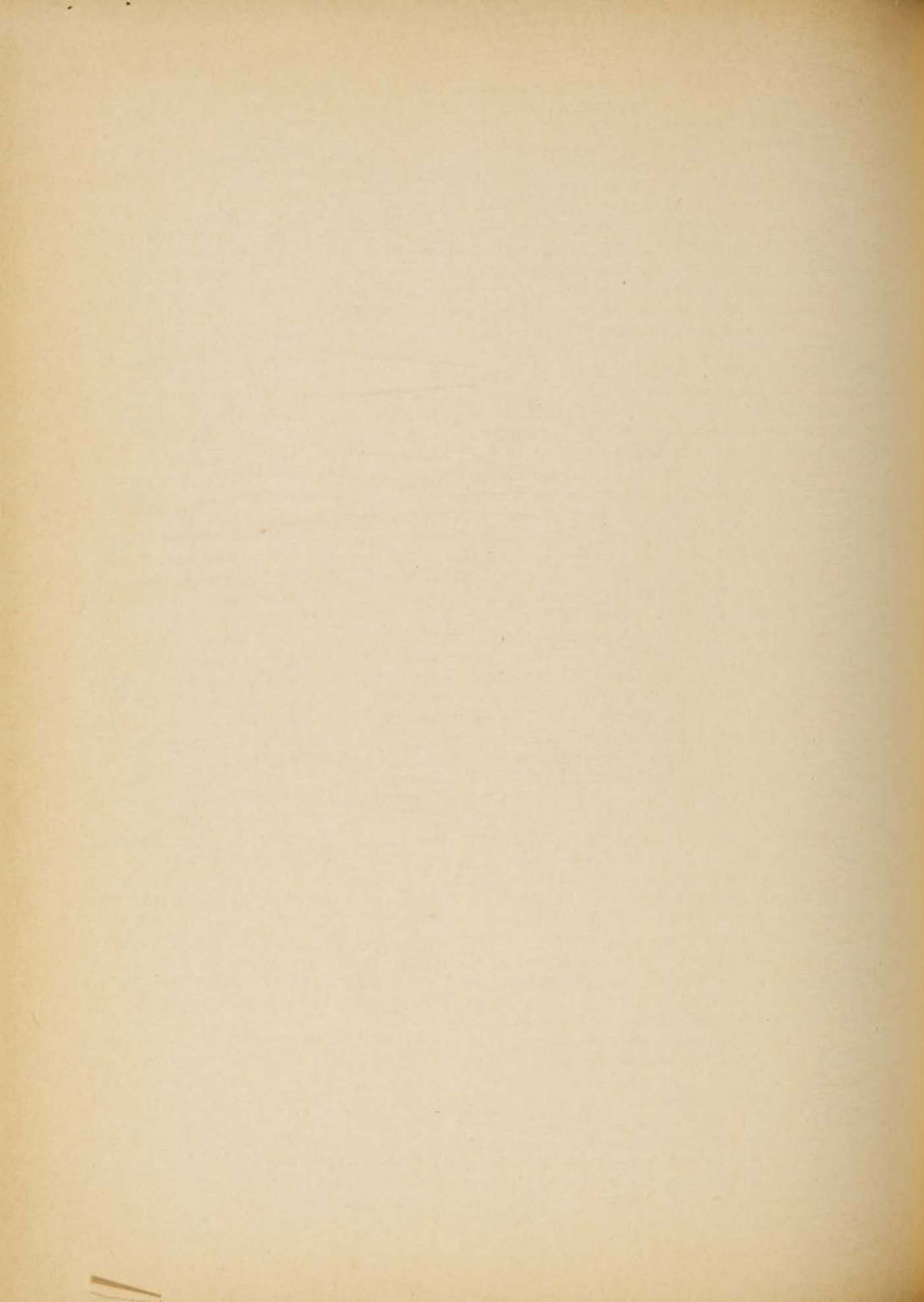
what risk a ship took when it went to sea in the days before typhoon warnings were broadcast. It was the terrible loss of life and destruction of property during the very severe typhoon of Sept. 1865 that led Very Reverend Juan B. Vidal, Superior of the Mission and Rector of the Ateneo, to establish an observatory called, "Observatorio del Ateneo Municipal" on the roof of the Ateneo. In this way, the Manila Observatory began its existence.

Three periods cover the history of the observatory. During the first period, 1865-1884, the observatory gradually expanded from its modest beginning and became indispensable. In 1884, the Spanish Government made it an official institution and helped in the further progress of the work. This second period lasted until 1899 when the American Government took over the Philippine Islands. The years from 1899 to the present time form the third period.

In 1865 Very Reverend Father Vidal appointed Father Francisco Colina as director of the new observatory and observation of pressure and temperature were taken on the "azotea" (roof) of the Ateneo. The Fathers of the college assisted him when they were not at class or attending to their priestly duties. Two years later Father Fedrico Faura, then a scholastic, was appointed to direct the work. As he was the one who established the observatory on a firm basis, his motives in guiding the destinies of the observatory at this time are interesting. His plans were to have the observatory cooperate in scientific progress, especially meteorology, and to study the typhoons of the China Sea in order to foretell their approach and thus prevent loss of life and property. In 1868, Governor Gandara commissioned an expedition, under the guidance of Father Faura, to study the total eclipse of the sun occurring that year. The expedition traveled to the island of Mautawalok, ($0^{\circ} 32'$ S. latitude and $122^{\circ} 20'$ longitude East of Greenwich) where they obtained excellent observations which were later on published by Father Secchi. When Father Faura went to Spain to finish his studies other men took charge of the observatory. As Father Faura knew that he would return and have charge of the new institution, he made arrangements for further preparation when his studies were finished and we find him working under Father Secchi during the year 1877. The next year he spent with all the best observatories in Europe. This training and experience, the best possible in those days, resulted in the establishment of the observatory on a firm basis. Father Faura returned to Manila thoroughly prepared for his task and he began at once to study typhoons. He also perfected the methods of recording data in his study of the records of previous years, and in spite of the fact that his assistants were taken from him and even he himself had to help the Ateneo faculty at times, he was able before the end of 1879 to give the first typhoon warning. This stirred the people of Manila who were skeptical and would not believe him until the typhoon was close enough to give visible signs of its approach. However, Father Faura had some friends who were interested in his work and who trusted him. One of these was the director of the port, who refused to allow any ship to leave the harbor. The evening before the typhoon came, visible signs in the sky vindicated Father Faura and showed the people that they had a new friend. Later, when they found out that forty two ships were lost among the southern islands, whereas none were lost at Manila, the full value of Father Faura's work was realized and now he had the cooperation of the Government.

In 1880, some severe earthquakes terrified the whole of Luzon and caused much loss of life. This led to the establishment of a seismic department in the observatory and the purchase of the best possible equipment. Father Faura's reports on the earthquakes of that year together with the instrumental records obtainable had a very wide circulation among European scientists. Since 1880, the observatory has increased its equipment and has many interesting records of earthquakes. In recent years, it has been found that there is a part of the ocean bed, about 60 miles away from the eastern coast of Mindinao, that cannot be reached by any of the modern methods of ocean sounding. This strange depression, called "The Philippine Deep" is one reason why the earthquakes are frequent in the Islands.

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Father Faura's first contribution to meteorological science occurred in 1862 when he published "Las Senales Precursoras de Temporal en el Archipielago Filipino" which came as a result of his studies in the observatory. This book enabled the general public to have a more extensive knowledge of typhoons and when a very severe typhoon occurred in October of that same year, the statements in Father Faura's book were verified and he received still more esteem and popularity.

It was not long before the neighboring countries realized the value of the typhoon warning from the observatory. As a cable between Hongkong and Manila was laid in 1880, the Governor of Hongkong asked for the service the observatory was giving to the ports of the Archipelago, and after settling difficulties with the cable company, agreement was reached, and the two cities exchanged meteorological data. Furthermore, acting on the advice of Father Faura, the British government established a meteorological observatory at Hongkong, but trouble developed later between the two observatories and Father Faura's part in the establishment of the observatory was forgotten.

In 1884, the observatory began the second period of its existence. Under the title, "Servicio Meteorologico, bajo la Direccion del Observatorio del Manila," the observatory became an official institution under the Spanish Government. From now on, sub-stations were improved, new stations established and more information published in the monthly "Bulletin" of the observatory. The observatory increased its service to the public and soon outgrew the space assigned for its use in the Ateneo. The present building was erected in 1886, the staff with its observatory records then moved into it.

About this time, (1880-1886) Father Faura designed his famous barometer "para la prevision del tiempo en el Archipielago Filipino." This is an aneroid barometer of the best quality, with the different weather conditions marked along the scale. When the pressure is above 760 mm., there will be "Nortes" or "Norterns," that is north winds bringing fair weather to the western regions of the Archipelago but rainy weather to the eastern and northern parts. If the pressure is between 755 mm. and 760 mm., there will be "variable weather"; between 751 mm. and 755 mm., there will be a "baguio algo lejo"; between 747 mm. and 751 mm., there will be a "baguio en la localidad o muy cerca"; between 730 and 747 mm., there will be a "baguio intenso", and between 700 mm. and 730 mm., there will be a "baguio destructor." The word "baguio" is a local word for typhoon. Invariably, the lowering of the pressure is accompanied by the weather indicated on the dial, a sign of the accuracy of Father Faura's work. His barometer is in extensive use today, especially in remote country districts.

In 1887, Father Martin Juan began observations on terrestrial magnetism. A new building was erected for this purpose and extensive studies of variations of the magnetic dip and of the angle of declination began. Father Juan intended to make a magnetic map of the Islands and then to investigate the origin and cause of the "collas" (the peculiar winds due to distant depressions or typhoons in the Pacific Ocean, northeast or north of the Islands.) For these purposes a special station was set up in Jolo, an island in the extreme southeastern part of the Archipelago. In the midst of his labors, Father Juan, when on an expedition along the eastern coast of Mindanao, was suddenly stricken with fever and, on July 9, 1888, died at Surigao. Father Cirera, however, kept up the series of observations that Father Juan began and published the results in the book "El Magnetismo Terrestre en Filipinas." At this time the observatory possessed, in the magnetic section, instruments for direct reading and for photographing the record of variations of declination together with vertical and horizontal components of the same. Later, when an electric car line on the street adjoining the observatory made magnetic observations impossible, a new building at Antipolo, a town about fifteen miles from Manila, was erected in 1910, the instruments installed, and the observations continued as before. There is an exceptional opportunity for investigating the laws of terrestrial magnetism due

to the proximity of Manila to the magnetic equator and the observatory has made excellent use of this opportunity.

Father Faura had the ambition of setting up an astronomical department in the observatory and he wanted none but the best instruments. Besides, he wanted these instruments to be beyond the power of any future official who might wish to appropriate the equipment for his own use or for use outside the domain of the Society. During 1882 and 1883, he collected the sum of seven thousand pesos (4500.00) for his instruments but he unfortunately lost most of this sum due to the failure of the bank in which he deposited it. Later on, however, he collected more money and was able to buy an equatorial telescope with an objective lens fifteen centimeters in diameter (5.9 inches), a suitable dome for the instrument, a spectrometer and a heliostat. Then, in 1886, an eighteen inch objective lens was purchased from the German optician Merz, a mounting and dome built, the present building erected for the telescope and always adjusted and ready for use in the first months of 1898. This equatorial telescope is the largest in the Orient.

In 1892, Father Faura was invited to attend the International Meteorological Congress to be held in Chicago in connection with the Columbian Exposition. He accepted the invitation, and, with Father Algue, who was then in America finishing his studies in practical astronomy under Father Hagen at Georgetown, took part in the Congress. Two publications from the observatory were presented to the Congress, namely "El Magnetismo Terrestre en Filipinas" by Father Cirera and "Las Turbonadas en Manila" by Father Saderra Mata.

In September 1893, an incident occurred which showed the importance of the warnings and forecasts of the observatory and the confidence placed in them at that time as well as the present. A typhoon warning was sent to Hongkong worded as follows: "Tifon en el Mar de la China, direccion WWN, si no inclina mas al N." (Typhoon in the China Sea, direction WWN, if it does not turn more towards the N). (Word underlined by writer.) In transmitting this message, the conditional "si" was accidentally changed to the conjunction "y" (and) so that the message, received at Hongkong read: "Typhoon in the China Sea, direccion WWN and it turns no more towards the N." The authorities there placed their typhoon signals along the coast of China DIRECTLY west of the Archipelago and thinking there was no danger along the coast line north of the Islands, sent no warning there. The typhoon, however, went northward, with considerable detriment to the shipping there. At once, a protest was sent to Manila, and investigation followed and the mistake of the cable company found. This incident shows how the Hongkong observatory depended upon the warnings sent by the Manila observatory, for if the Hongkong staff could have verified the reports from Manila by consulting their own data, the mistake would have been discovered before the signals were placed. That the mistake was not seen and that they should place their signals according to the incorrect warning received, manifests the importance of the Manila observatory and the confidence placed in its work. Even at the present time, captains of the largest ships consult the observatory regarding dangers to be encountered when a typhoon is approaching and their confidence in the advice of the observatory has never wavered.

Mr. E. Dousette, S.J.

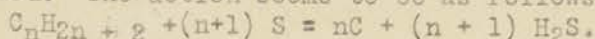
CHEMICAL REFERENCES.

"Economy Doctrine and Chemical Analysis," A. Sulfrain, in CHEM. ZEITUNG, 1925, xlix, 101; CHEMICAL ABSTRACTS, 1925, xix, 1233. The application of a modified "Taylor System" to the work of the analytical chemist will show that about 80 per cent of the usual motions are unnecessary. It is urged that more attention be paid to economy of time in the laboratory instructions of the colleges.

"A Practical Pressure Filtering Device for Laboratory Use," by A. Hannemann, in CHEM. ZEITUNG, 1925, xlix, 140; CHEM. ABSTRACT, 1925, xix, 1355.

"Substitutes for Platinum," by A. Gawalowski, in Z. ANAL. CHEM., 1924, lxiv, 473; CHEM. ABSTRACT, 1925, xix, 1969. Alargan (Ag-Al), platargan (Ag, Al, Pt) and platnik (Ni-Pt) can replace Pt in most analytical operations.

"A Convenient Method for Generating H₂S," by A. Henwood, R. M. Garey, W. Goldberg and E. Field, in J. FRANKLIN INST., 1925, cxcix, 685; CHEM ABSTR., 1925, xix, 1998. Into a 15 cc. test tube fitted with a singly bored cork and delivery tube is placed a mixture of S and paraffin wax (preferably with finely divided ignited asbestos), and upon heating to a temperature slightly above that at which the S is in a plastic state, as by the use of the bunsen flame about 2.5 cm. hig, H₂S is evolved. The action seems to be as follows:-



Ten cc. of the charge yields about 2000 cc. of the gas. The evolution of H₂S ceases within one minute after the flame is removed and the charge when exhausted is then easily removed, leaving the apparatus ready for the new one. The H₂S is pure.

"The Molecular Weights of Proteins," E.J. Cohn, J.L. Hendry, and A.M. Prentiss, in J. BIOL. CHEM., 1925, lxiii, 721; CHEM ABSTR., 1925, xix, 2059. The following values were obtained for the minimal mol. wt. of the respective proteins:- gelatin, 10,300; zein, 19,400; gliadin, 20,700; hemocyanin, 22,700; edestin, 29,000; hemocyanin (octopus), 33,500; egg albumin, 33,800; glutenin, 36,3000; fibrin, 42,000; serum albumin, 45,000; hemoglobin, 50,000; serum globulin, 81,000; casein, 192,000.

"Rapid Separation of Sulfur Precipitated in Analytical Solutions," by M. Awschalom, ANALES SOC. CHIM. ARGENTINA, 1924, xii, 461; CHEM. ABSTR., 1925, xix, 2316. The milky S produced by the oxidation of H₂S in analytical reactions is precipitated as a coherent pellicle by a single vigorous shaking with ether.

"Removal of Sulfur Chloride and Other Similar Liquids from Carboys," by R. Defries, in CHEMISTRY AND INDUSTRY, 1925, xlv, 675; CHEM. ABSTR., 1925, xix, 2761. A bottle is fitted with a rubber stopper carrying two pieces of glass tubing bent at right angles, over the ends of which are rubber connecting tubes provided with screw clamps. The bottle is evacuated with a filter pump, then connected with a long tube dipping into the liquid in the carboy, the clamp opened, and the liquid allowed to flow into the bottle. A cork bung carrying a glass tube reaching to the bottom of the carboy, and a shorter one acting as an air inlet may be used in the carboy.

G.J. Shiple, S.J.

PUBLICATIONS.

ARMY ORDINANCE, the Journal of the Army Ordinance Association publishes in its July-August number an article by Mr. F.G. Power S.J., of Fordham University, entitled "A Calculated Relation Between the Ballistics of the 75 mm. gun and the Mean Web of the Powder." The review in its "Who's who" in this issue states that Mr. Power is professor at Fordham and that the article records "some important research work which he performed immediately after the war. His investigations and calculations will be of interest to our many readers who follow the remarkable strides being made in the improvement of American propellants."

Mr. R.J. McWilliams S.J., of Woodstock, has an interesting article in the AMERICAN ECCLESIASTICAL REVIEW for September on "The Mentality of the Paleolithic Man."

The veteran astronomer of our sister Province of Missouri, Father W.F. Rigge S.J., has an article in POPULAR SCIENCE for October on "The Second Stage in the Reform of the Present Calendar." Father Rigge celebrated the golden jubilee of his entrance into the Society last spring at Creighton University, Omaha, Nebraska. We are glad to extend our congratulations to the eminent jubilarian whose achievements and writings in science and especially in astronomy have been an inspiration to so many of his brethren not only of the Missouri Province but of many other Provinces of the Society. We wish him many years of health and strength to carry on his good work.

THE TABLET for March 23, 1925, contains an interesting sketch of the late Father Cortis who for a number of years was Director of the Stonyhurst Observatory.

Last August the "Physics Syllabus for High Schools" of the Maryland-New York Province was published. It is a booklet of 29 pages and gives a list of topics for the lecture course and a list of experiments for the laboratory. It also contains some suggestions regarding the purpose of the course and the treatment of the subjects which appertain to the high school. A bibliography is appended.

NEW DIRECTOR OF THE GEORGETOWN ASTRONOMICAL OBSERVATORY.

During the summer we learned of the appointment of Father E.C. Phillips S.J. to the director-ship of the Georgetown Observatory in succession to Father P. Archer S.J. who is now head of the department of mathematics at Boston College. Father Phillips who took his Ph.D. in mathematics at Johns Hopkins in 1908 has been for the past few years professor of mathematics and astronomy and Prefect of Studies at Woodstock College. He also had charge of the Observatory there. He has read a number of papers at the meetings of the American Astronomical Society. Some years ago he devised an interesting instrument for reducing transit observations which was subjected to a successful test at the U.S. Naval Observatory. A description appeared in POPULAR ASTRONOMY. As will be remembered, when a transit is used in the meridian a correction must usually be added to the time of transit of a star across the middle wire in order to obtain the time of transit across the true meridian. This correction is given by the equation $t = aA + bB + cC$, where a , b , c are the azimuth, level and collimation constants respectively of the instrument and A , B , C are constants depending upon the latitude of the observatory and the declination of the star. The transit reducer makes it possible to obtain the sum of the products aA , bB , and cC , mechanically, thus effecting a great saving of time. While in Europe a year ago attending the Cosmological Conference at Rome, Father Phillips had an opportunity to visit some of the principal observatories in England and on the continent. He attended the September meeting of the American Astronomical Society at Goodsell Observatory, Northfield, Minnesota. He appears in a group picture of the meeting published in POPULAR ASTRONOMY for October 1925. We wish Father Phillips every success in his new field of labor and we congratulate Georgetown University and Observatory on its good fortune in adding him to its faculty.

HOUSE OF PHILOSOPHY AT WESTON, MASS.

Work was continued all last year on the north wing and north end of the main building, and towards the end of July the first and second year philosophers moved from the Mansion and Bapst Hall into their new quarters in the new building. The first year men found their new rooms ready for them upon their arrival from St. Andrew and Shadowbrook. Ground was broken for the chapel the middle of June. During the summer Bapst Hall and the Recreation Hall were razed to the ground and an active steam shovel made the necessary extensive excavations for the rest of the structure. At present construction on the chapel and on the central east wing is well under way and work is also going on on the south end of the main building. The foundations of the south wing are finished.

During the summer the science department was moved from Bapst Hall to the basement of the main building. Temporary quarters will be occupied there until the south wing is finished. More laboratory apparatus for physics was shipped from Woodstock in September. We now have the full three years course of philosophy. The faculty for first and second years is the same as last year. In addition we have Fathers W. Brosnan, C. Lamb and J. Cahill who came from Woodstock, and Father Keyes who came from Boston College. Father John Casey is Spiritual Father. In third year Father W. Brosnan teaches Natural Theology, Father Lamb teaches Ethics, Father Cahill teaches Classics and Pedagogy and Father Keyes teaches History of Philosophy. Father J. Brosnan has Geology and Father Brock third year Mathematics.

Last year the United States Department of Agriculture issued Farmers' Bulletin No. 1441 entitled "Rural Planning, the Village," by W. C. Mason. It states that nearly 20,000,000 people in the United States live in villages. These villages are also the service stations of more than 30,000,000 people for purposes of business, education, religion, health and social well-being. It is obvious that these thousands of villages should be properly planned to make living and social conditions more healthful, attractive, and effective for their populations. The bulletin attempts to show how this may be done by giving instances of what has been done in numerous villages in various states. It shows the importance of such planning and with what facility good results may often be attained. The first model proposed is Weston, Mass. The author says: "A good example of a village with little original planning which recognized, though tardily, the need of a more attractive and efficient arrangement may be found at Weston, Mass., a town of 2,282 people which has recently established a civic center, at the same time doing away with a disfigurement of the landscape." Reference is made chiefly to the removal of the post office and store in the center of the town and the tearing down of the old town hall and some old buildings together with the conversion of a large adjoining area of swampy land into an attractive village green beside which a beautiful town hall in colonial style was built. Stockbridge, the home of our New England Novitiate and Juniorate, is also mentioned as "a modern village with many well-planned features which has probably had a greater influence for good on the beauty and cleanliness of other towns and villages than any in the country."

WOODSTOCK COLLEGE.

Woodstockians of past years who might perchance journey up the valley of the Patapsco would hardly recognize their Alma Mater. The Theologians' wing has been extended nearly to the Power House, a large chapel of granite is approaching completion in the north quadrangle between the two wings, and an extension to the Philosophers' wing is under construction. The latter will contain a large, modern kitchen. The two towers have been raised considerably to make room for additional water tanks. Mr. Shiple writes: "The new west wing is now almost up to the roof. The new east wing, of course, has been occupied since about the middle of September. In the new chapel they are getting ready to do the decorating. The six side altars and the main altar are all installed. These altars are all of marble imported from Italy. It is expected that the chapel will be ready for occupation shortly after Christmas." For the first time in its history Woodstock has only theologians in residence, all the philosophers of the province and vice-province being at Weston.

OURS AT JOHNS HOPKINS UNIVERSITY.

Father A. H. Poetker, of the Missouri Province, is continuing his post-graduate work in Physics, and Father J. J. Sullivan who finished his theology at Woodstock last year has matriculated for work in Chemistry. Father Gerst who received his doctorate in Mathematics a year ago is now teaching at St. Louis University.

L. D. S.

(Reprint)

