THE library of the school of tropical medicine of the University of Porto Rico under the auspices of Columbia University has been presented with the twenty-four volume set of Saccardo's "Sylloge Fungorum," a notable work in Latin which contains the description and classification of approximately 140,000 species. The cost of these volumes is practically prohibitive for most medical libraries and their gift to the School of Tropical Medicine by Dr. William J. Matheson (Matheson Encephalitis Commission), of Manhattan, was for the purpose of stimulating developments in tropical mycology in Porto Rico.

UNIVERSITY AND EDUCATIONAL NOTES

FOUR new buildings, completed at a cost of more than $1,400,000, are ready this autumn at the University of Pennsylvania. Chief among the structures is the Martin Maloney Memorial Medical Clinic of the University Hospital, which was built at a cost of $1,000,000 largely through donations from the late Martin Maloney. The other buildings are the Ward, Warwick and Chestnut dormitories, which have been built at the southeast end of the large dormitory quadrangle. Their total cost was about $400,000.

DR. JOHN A. MILLER, of Swarthmore College, is retiring from teaching and administrative work to become research professor of astronomy. He will continue in charge of the Sproul Observatory and will devote his time to a study of certain problems connected with the corona of the sun. Dr. Arnold Dresden, of the University of Wisconsin, succeeds Dr. Miller as head of the department of mathematics and astronomy.

GEORGE FRANCIS BASON, assistant professor in the department of electrical engineering at Cornell University, has become head of the department of electrical engineering in the University of North Carolina.

DR. ROBERT S. STONE has been appointed assistant professor of roentgenology at the University of California Medical School; Dr. Henry H. Searls has been promoted to associate professor of surgery; Dr. Gordon E. Hein to associate professor of medicine, and Dr. Randolph L. McCalla to assistant professor of medicine.

DR. LLOYD W. FISHER, of Reading, has been appointed professor of astronomy and geology at Bates College to succeed Professor Frank D. Tubbs, whose resignation was accepted last commencement after twenty-two years' service.

DR. REGINALD H. PEGRUM, who formerly divided his time between the University of Buffalo, as assistant professor of geology, and the Buffalo Museum of Science, as curator of geology, has resigned from the latter institution to accept a full-time appointment at the university. As research associate in geology of the Buffalo Museum of Science, he will continue his geologic studies in connection with the Lake Erie Survey begun in 1928.

M. FLAMANT, professor in the faculty of Clermont-Ferrand, has been appointed professor of general mathematics in the University of Strasbourg to succeed M. Cerf.

DR. VICTOR M. GOLDSCHMIDT, of Oslo, Norway, has been called to a professorship of mineralogy at the University of Göttingen.

DISCUSSION

A NEW SPECIES OF MONO-MUCOR, MUCOR SUFU, ON CHINESE SOYBEAN CHEESE

THE utilization of fermentation micro-organisms was known so early in China that we can trace it back to the Hsia Dynasty, 2000 B. C. Indeed our ancestors had applied these organisms to a wide range of uses. Many tasty foods and drinks and valuable medicines, the manufacturing methods of which were invented and improved upon by our ancestors, are still produced in every part of our country. From the scientific point of view, the old manufacturing methods seem to be fundamentally sound. For example, the regulation of temperature, the purity of the culture and the means of pasteurization and preservation are conducted so skilfully that we can not but be impressed with the painstaking and accurate observations on natural phenomena in the past. The application of a mono-mucor in the manufacture of "sufu" is such an example.

"Sufu" or "tosufu" is a well-known dish in the Chinese dietary. It is made from soybeans and is sold everywhere in groceries. The method of manufacture is handed down from generation to generation. At first soybeans of selected quality are cleaned with water and ground in a stone mill into a milky paste, which is then heated to the boiling-point and filtered through linen cloth. With the addition of a suitable quantity of brine the protein is

coagulated into a curd known as "tofu." The tofu is pressed in wooden molds into blocks of desirable sizes, which are then arranged on bamboo trays and left in the fermentation chamber for about a month. The manufacture of sufu begins in December and ends in February. The average temperature of the fermentation chamber is found to be 14° C. After this treatment these blocks are transferred to large earthenware barrels, each having a volume of seven hectoliters. Then salt and Shoushing wine are added one after the other to the blocks, mainly for the purpose of preservation. The barrels are finally closed, covered with wooden plates and left unopened for about three months. After this procedure the blocks, having acquired a peculiar flavor, are ready for sale. The products seen on the market are usually red or white blocks 2 to 4 cm square and 1 to 2 cm in thickness. The white ones are untreated, while the red ones are colored with "hung chu," which is derived from the culture of another mold, *Monascus purpureus,* on rice.[1]

Sufu is manufactured in large quantities in the region of Shoushing in Chekiang Province and Soochow, Wushih, and Changchow in Kiangsu Province. The native manufacturers know how but not why such flavored sufu is produced. They believe that the fermentation is controlled by one of the gods, to whom they make prayers for its success.

Early in my research on sufu I found in the fermentation chamber of a factory in Shoushing gray mycelium about 2 cm in height covering the whole surface of the blocks. As I deemed this mycelium to be valuable for scientific research, I made a culture of it on the spot and brought the culture back to Nanking. The mold which produces this mycelium was isolated. It appears to be an undescribed species of Mucor for which the name *Mucor sufu* is proposed.

The mycelium produced by the mold is white at first but later becomes grayish yellow, the culture media being soybean-agar, koji-agar and tofu. There are no septa in the hyphae. Single aerial hyphae with spherical sporangia are developed from the mycelium. The sporangium when old is grayish-yellow in color and on its surface has neeedle-shaped crystals of calcium oxalate. The columella is also spherical. The diameter of the sporangium is 14.61μ to 28.42μ, and that of the columella is 8.12μ to 12.08μ. The sporangiospores are elliptical in shape with smooth surfaces and have a dimension of 4.9μ–12.58μ x 3.24μ–8.0μ. Soybean is a good medium for the culture of the mold. On bread or boiled rice the mold develops very imperfectly. For sucrose, glucose, fructose, maltose, mannose, lactose, galatose, raffinose, arabinose and xylose it has no fermentation power. It does not liquefy gelatin culture media but causes soybean juice to be slightly acidified and coagulated. On observing under a microscope a cross-section of sufu made from the pure culture of the mold on tufu, one can see that the mycelium of the mold has penetrated the sufu to the center. The optimum temperature for the growth of the mold is 29° C. The mold does not produce rhizoids. It is a mono-mucor.

From the observations recorded above I conclude that the transformation of tofu into sufu is due to the growth of this Mucor. It is also interesting to note that the mono-mucor on sufu manufactured in Shoushing in Chekiang Province and that in Soochow, Wushih, and Changchow in Kiangsu Province is all of the same species. In ancient times traveling was handicapped by lack of railway connections between Chekiang and Kiangsu, nearly three hundred miles apart. It is remarkable that the mold on sufu manufactured in these two provinces should be of the same species, a coincidence of historical as well as biological importance.

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[1] For an account of experiments by Margaret B. Church on the production of this red coloring matter, see *Journal of Industrial and Engineering Chemistry,* 12: 45–46, January, 1920.

CONCERNING HETEROTHALLISM IN PUCCINIA GRAMINIS

IN 1927, J. H. Craigie[1] published evidence of heterothallism in *Puccinia helianthi,* and in 1928[2] extended the work to other rusts, including *Puccinia graminis.* He reported that, in the haploid generation, isolated mycelia produced pycnia but, in the great majority of cases, no aeciospores. If two mycelia coalesced or if pycniospores of one infection became mixed with pycniospores of another, approximately 50 per cent. of the combinations resulted in the production of aeciospores. This led him strongly to the belief that haploid mycelia and pycnia are either (+) or (−) and that the diploid generation is initiated when (+) and (−) meet.

A cytological study of infections of *Puccinia graminis* on the European barberry adds weight to this hypothesis. An isolated infection consists of haploid mycelium and pycnia. Abundant pycniospores are formed and the drop of pycnial exudate on the upper surface of the leaf is maintained for five or six weeks or even longer. Structures resembling aecia form at the normal time and place, but they

[1] "Discovery of the Function of the Pycnia of the Rust Fungi," *Nature,* 120: 116–117 and 765–767. 1927.
[2] "On the Occurrence of Pycnia and Aecia in the Rust Fungi," *Phytopathology,* 18: 1005–1015. 1928.