period mentioned, and a large number of those in foreign lands. The name of one of the greatest men in the world's political history is also to be found here, that of Napoleon Bonaparte, who was elected resident member of the section of mechanical arts in the First Class of the reorganized Institut National, on December 25, 1797 (5th Nivôse An VI.); two years later he became president of this class. It should be borne in mind that this was at the very outset of his career, in the year of the first Italian campaign. In our own day another soldier of France, General Gallieni (diéd May 27, 1916), who aided greatly in the defense of Paris during the critical first weeks of September, 1914, was a correspondent of the section of geography and navigation.

One of the most interesting figures among the academicians of the past century was the centenarian chemist, Michel Eugène Chevreul, born September 1, 1786, elected member of the section of chemistry, August 7, 1826, president of the Académie in 1839 and 1867 and who died in Paris April 9, 1889, aged one hundred and two years, seven months and eight days, his lifetime extending from the reign of Louis XVI. down to the centenary of the French Republic.

The oldest member living at the time the *Annuaire* went to press was the rural economist Jean Jacques Schlœsing, born in Marseilles, July 9, 1824, and therefore now in his ninety-third year. The Académie counts two other nonogenarians, the rural economist Auguste Chauveau, born November 21, 1827, and the mathematician Charles Wolf, born November 27, 1827; there are a half-dozen octogenarians.

Of the correspondents chosen from 1795 to 1917, eighteen were born in the United States; three of them, the astronomers Edward Charles Pickering and George Ellery Hale, and William Morris Davis, correspondent of the section of Geography and Navigation, are still living.

The organization of the Académie at the present time permits the election of 66 full members (Membres Titulaires), six for each of the eleven sections. There are besides two perpetual secretaries, one for the division of mathematical sciences, the other for that of physical sciences, ten Académiciens Libres, six Membres Non Résident, and twelve Associés Étrangers; to these may be added 116 correspondents. The full complement in the different classes, and the number actually registered at present, are given as follows:

	Allowed by Statutes	Registered in Yearbook
Membres Titulaires	66	57
Secrétaires Perpétuels	2	2
Académiciens Libres	10	9
Membres Non Résidents	6	4
Associés Étrangers	12	6

The members of the Académie are distributed in eleven sections, the division *sciences mathématiques* comprising five sections, geometry, mechanics, astronomy, geography and navigation and general physics, the *sciences physiques* embracing the following six sections: chemistry, mineralogy, botany, rural economy, anatomy and zoology, and medicine and surgery. Each of these eleven sections is restricted to a membership of six, so that a scientific specialist, however great his renown, must await not merely a vacancy in the Académie, but one in the particular section to which he belongs. By this means an equal balance is always maintained and there can be no undue preponderance of any single scientific branch, or of any group of such branches.

G. F. K.

THE PINK BOLL WORM

THE newspapers of the country in the last few months have called attention to the fact that a most serious pest of the cotton plant known as the pink boll worm (*Gelechia gossypiella* Saund.) has been established in northern Mexico through the shipment of several tons of Egyptian cotton seed to that country in 1910. The insect is one which is especially likely to be transported over long distances. It can live for more than a year in stored cotton seed, thus furnishing an opportunity for shipment to the remotest parts of the globe. As a matter of fact it was carried from

India, which was probably its original home, to Egypt about a dozen years ago in cotton seed.

The Department of Agriculture has undertaken strenuous measures to prevent the introduction of the pink boll worm from Mexico. The introduction of cotton seed and of baled cotton which often carries scattered seeds has been prohibited, and Congress has made a special appropriation under which very thorough work in enforcing quarantine measures can be done on the Texas border.

It is interesting to note the recent experience of Brazil with the pink boll worm. In 1913 the Brazilian government paid considerable attention to the encouragement of the culture of Egyptian cotton in that country. An agent was sent to Egypt and large quantities of seed were shipped to Brazil. This seed was distributed throughout the republic by a branch of the Ministry of Agriculture. This branch has inspectors in every state capital. Each one of these received quantities of the seed and distributed it free to all applicants. A more thorough method of dissemination of an insect in a new country could hardly be devised. Early in 1914 a careful survey of the cotton belt of Brazil was made by an American who was engaged in the encouragement of cotton culture in the republic. He found no indications of the cotton boll weevil for which he was looking especially or of any other insect pest attacking the seed or bolls. Late in 1916 he made another trip over the same territory and found that the pink boll worm was generally and thoroughly established. In fact the pest was so numerous that the yields of certain fields were reduced by half. Naturally the situation attracted great attention and many suggestions were made about relief measures. Some of the legislators suggested the passage of a law compelling the burning of all cotton fields in Brazil. Of course it is too late to stamp out the insect by any such means, but the whole episode emphasizes enormously the importance of quarantine measures to prevent the introduction of pests which in all probability can never be exterminated when they have once become established.

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SPECIAL ARTICLES

THE EFFECT OF RETARDATION OF GROWTH UPON THE BREEDING PERIOD AND DURATION OF LIFE OF RATS[1]

During the course of our experiments on nutrition we have had a number of rats which were stunted for various periods of time. With respect to these animals the question has frequently been raised as to whether this retardation of growth tended to prolong their life beyond the average span; that is, whether physiological age is a function of time alone or also of growth. The inquiry then becomes pertinent as to what may be considered the average length of life of a rat.

Donaldson[2] states that "a rat three years old may be regarded as corresponding to a man ninety years old." Slonaker[3] has reported that one of his rats reached an age of 45 months; and recently one of our rats, although fed on a uniform experimental diet since it was 6 weeks old, reached the age of 40 months —the longest life yet recorded for our colony. In an attempt to find out how long our rats might be expected to live, we have at various times set aside a number of stock rats to be kept under our ordinary laboratory conditions during their entire lifetime. Out of 91 such animals, 17 (19 per cent.) died under one year of age; 48 (53 per cent.) died between one and two years of age; and 26 (29 per cent.) lived more than two years, the oldest one reaching an age of nearly 34 months. From these figures it is evident that less than a third of the rats in our colony may be expected to live to be more than two years old.

Considering the wide variations in the ages of these rats it was thought that possibly a more definite, although an indirect answer to the question of the effect of stunting upon the length of life might be obtained by determining the age to which stunted females remain

[1] The expenses of this investigation were shared by the Connecticut Agricultural Experiment Station and the Carnegie Institution of Washington, D. C.

[2] Donaldson, H. H., "The Rat," Memoirs of the Wistar Institute, No. 6, Philadelphia, 1915.

[3] Slonaker, J. R., *J. Animal Behavior*, 1912, II., 20.