and a reduced cambial activity accompany flowering.[3] The further similar observation has been reported that the condition of the phloem appears to be particularly correlated with blossoming in a number of dicotyledonous plants.[4] These represented a wide range of reproductive habits.

Some of the phloem characteristics which have been seen to accompany blossoming are: (1) Limited or slight formation of phloem cells following reduced cambial activity which precedes blossoming; (2) small size of later formed cells; (3) increase in cell wall thickness; (4) increase in callose formation on sieve plates and fields; (5) accumulation of inclusions in some cells; (6) mechanical compression.

These various characters appear in unequal degree in different plant species or varieties. For example, the fruitful branches of the ornamental lemon are characterized by much callose formation; the stems of blossoming *Chrysanthemum* by small secondary phloem cells; or the stems of fruiting *Phaseolis vulgaris* by very little phloem.

It also seems significant that plants which produce an abundance of flowers, as the precocious *Begonia semperflorens,* have a very slight development of phloem. In contrast to this group, those which rarely flower, as the variegated *Vinca major* in the greenhouse, have an abundance of phloem tissue.

The conditions of the phloem tissue which accompany blossoming appear to have their effects in much the same manner as artificial girdling. In fact, the question may properly be asked if blossoming is not the result of "natural girdling."

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THE BLACK WIDOW SPIDER

THE only spiders, excepting the Tarantulas, which have gained a wide and infamous reputation are species of *Latrodectus,* a genus of the family Theridiidae. Wherever these spiders occur all kinds of conflicting stories are current among the peoples. There are authentic reports of serious and disagreeable symptoms even fatal results from the bite of these spiders as well as equally authentic reports of bites causing no harm. The contents of the poison sac are controlled by muscular action, probably voluntary on the part of the spider. Thus a bite may be harmless or not, depending upon the amount of venom injected.

Within recent years the literature concerning the common American species (*Latrodectus mactans* Fabr.), the black widow, has greatly increased. It seems that during this time the spider has greatly extended its geographical range. In the United States it first attracted attention in the South and was thought to have a southern distribution only. Cases of arachnidism or spider poisoning have seemed to increase during recent years. In the majority of cases the spider concerned has been the black widow. Therefore its distribution and various activities have attracted attention.

The first comprehensive study and compilation of the literature was that of Bogen.[1] From this work the distribution of the spider could be ascertained, and it was noticeable that it had not been reported from any of the midwestern states.

The next work which gave the distribution of this arachnid was that of Burt.[2] This worker added to the distributional records of Bogen, but still the spider was not recorded from the states of the upper Mississippi valley. A few states on the east coast and Oregon on the west were not represented. Since the spider has such a general distribution one could be practically certain that it occurs in all the states. Nevertheless, the only authentic, scientific records should be based on actual specimens from a definite locality and accurately determined.

The present writer wishes to record this spider (*Latrodectus mactans* Fabr., det. W. M. Barrows) from the following localities in southern Illinois: 1 female, Flora, October 1, 1934 (E. Booker); 1 male, Thebes, December 5, 1934 (H. H. Ross); 1 male, Carbondale, May 30, 1935 (H. H. Ross and C. O. Mohr).

In addition to these records Mr. W. P. Flint has very kindly furnished the following ones from his files in the Section of Economic Entomology of the Illinois Natural History Survey: Bellville, September 24, 1934; Flora, October 4, 1934; Jerseyville, November 6, 1934; Irvington, November 12, 1934; Edwardsville, July 12, 1935 (Alfred Rant); Barry, September 28, 1935 (R. L. Poppenhager). The sex or number of specimens was not indicated. As in the previous paragraph all localities are in Illinois.

The writer desires at this time to mention a few additions to the literature of the black widow which have been made since the bibliographies of Bogen and Burt.

A circular[3] has been published from the Oregon Agricultural Experiment Station which records the spider from that state and gives general information. It is mentioned as being most numerous in the eastern portion of the state. Thus this spider has now been recorded from every state west of the 100th meridian.

[3] Ocra C. Wilton and R. H. Roberts, *Bot. Gaz.*, September, 1936.

[4] R. H. Roberts, "A Discussion on Fruitfulness." Conference of Pacific N. W. Horticulturists, Entomologists and Plant Pathologists, Bozeman, Montana, July 15, 1936.

[1] *Anns. of Internal Medicine,* 6: 375, 1932.

[2] *Jour. Kans. Ent. Soc.,* 8: 117, 1935.

[3] *Oregon Agric. Expt. Station, Circ.* 112, 1935.

Another recent study has been published from the California Agricultural Experiment Station.[4] This reviews the life history and gives general information. The same general remarks will apply to W. J. Baerg's publication[5] from Arkansas. This includes a bibliography.

The most comprehensive study which has appeared is that of D'Amour[6] *et al.* from Colorado. These workers consider the spider and its venom rather thoroughly, and their paper should be read by all who are interested in the black widow and its activities.

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REPORTS

THE RESPONSIBILITY OF ENGINEERING

PRESIDENT ROOSEVELT has addressed to Dr. Karl T. Compton, president of the Massachusetts Institute of Technology, and to the heads of other schools of technology and engineering an open letter that reads:

Events of recent years have brought into clearer perspective the social responsibility of engineering.

In respect of wise use of natural resources such reports as those of the Mississippi Valley Committee, the National Resources Committee and the Great Plains Drought Area Committee have brought out the facts impressively. The enclosed report, "Little Waters," presents in miniature many of the social-engineering problems of soil and water conservation.

In respect of the impact of science and engineering upon human life—social and economic dislocations as well as advance in productive power—the facts are revealed with distressing clearness in public records of unemployment, bankruptcies and relief. The responsibility of scientists has been analyzed in noteworthy addresses such as, among the most recent, those presented at the Tercentenary Celebration of Harvard University and the meeting of the British Association for the Advancement of Science.

The design and construction of specific civil engineering works or of instruments for production represent only one part of the responsibility of engineering. It must also consider social processes and problems, and modes of more perfect adjustment to environment, and must cooperate in designing accommodating mechanisms to absorb the shocks of the impact of science.

This raises the question whether the curricula of engineering schools are so balanced as to give coming generations of engineers the vision and flexible technical capacity necessary to meet the full range of engineering responsibility.

I am calling this matter to the attention of educators of high administrative authority in the hope that it may be thoroughly explored in faculty discussions and in meetings of engineering, educational and other pertinent professional associations.

To this letter President Compton made on October 23 the following reply:

In response to your challenge to educators to give students the necessary "vision and flexible technical capacity," and to engineers to "cooperate in designing and accommodating mechanisms to absorb the shocks of the impact of science," I am sure you will be pleased to know that these are already matters to which progressive educators and engineers have been giving most earnest and constructive attention through their schools and professional organizations. To this end, for example, increasing emphasis is being placed upon fundamentals rather than specialties in undergraduate engineering education, and there has been a notable increase in attention to the study of economics and social science.

I can not but wonder why your exhortation has been directed specifically toward engineers, for surely we would agree that similar breadth of knowledge and training is also urgently desirable among business leaders, economists and politicians—as is also thorough training in fundamentals. For example, there is a tendency in some quarters to make science the major scapegoat of our social ills, from which social planners will rescue us. What are the facts?

Just before the advent of the machine age, social planners were devising resettlement projects and model industrial communities based upon a scheme to employ labor of all children above the age of four years. This was their best solution of the desperate struggle of the masses of the people for the bare necessities of life. Since that time science and engineering have so increased productive power that it has been possible for enlightened public leaders to inaugurate a great program of social security, including child labor laws, universal education, moderate hours of labor, pensions, insurance and unemployment relief on a large scale. These are superimposed on an enormously improved general standard of comfort, health and interest in living. Such achievements of science dwarf into insignificance the "social and economic dislocations" to which you refer, unfortunate as these are and much as these merit the attention which you recommend.

One significant fact is generally unrecognized by those who are chiefly impressed by the fact that science, through machine production, has displaced human labor. It is that such machines are, by and large, products of a relatively old branch of science, mechanics, whereas the present day activities in science are principally in electricity, chemistry, metallurgy, biology and such newer branches as lead to new knowledge, new products, new industries, new employment and improved health and material welfare.

[4] *California Agric. Expt. Station, Bull.* 591, 1935.
[5] *Arkansas Agric. Expt. Station, Bull.* 325, 1936.
[6] *Quart. Review of Biology,* 11: 123, 1936.