may predict in the following tables the normal states for the neutral and ionized atoms of the first and second long periods, by taking away successively one n_1 electron.

Our table for the first spark spectra deviates from that of Hund,[12] but it is a consequence of our general principle. Experiments extending these principles to Mo and W are being carried on.

NORMAL STATES OF ELEMENTS OF THE FIRST AND SECOND LONG PERIOD

	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn
I	^2D	^3F	^4F	^7S	^6S	^5D	^4F	^3F	^2S	^1S
II	^3D	^4F	^5F	^6S	^7S	^6D	^5F	^4F	^1S	^2S
III	^2D	^3F	^4F	^5D	^6S	^5D	^4F	^3F	^2D	^1S

	Y	Zr	Cb	Mo	EkaMn	Ru	Rh	Pd	Ag	Cd
I	^2D	^3F	^6D	^7S	^6D	^5F	^4F	^1S	^2S	^1S
II	^3D	^4F	^5D	^6S	^5D	^4F	^3F	^2D	^1S	^2S
III	^2D	^3F	^4F	^5D	^6S	^5D	^4F	^3F	^2D	^1S

C. C. KIESS
O. LAPORTE

BUREAU OF STANDARDS,
WASHINGTON, D. C.

THE PERFECT STAGE OF CYLINDROSPORIUM POMI[1]

DURING the spring of 1924 an ascomycete was discovered upon overwintered apple leaves in Adams County, Pennsylvania. When cultured it showed the characteristic conidial fructification of *Cylindrosporium Pomi* Brooks, the cause of apple fruit spot. The similarity in growth of the two organisms on agar media was so striking that plans were at once made to determine by inoculation experiments whether they were the same.

Single ascospore isolations were made and the resulting conidia were used as inoculum on Stayman, Winter Banana, Baldwin and Grimes Golden varieties of apples, and also upon quince. Atomized inoculations were made both within special chambers attached to the twigs and in the open, from three to six exposures being made successively on different fruits at varying intervals from June 26 to July 28. The results were successful upon Baldwin, Grimes Golden and Stayman but inconclusive upon Winter Banana and Quince, since on the former only three spots developed and the quinces rotted on the tree. The check apples were free of the disease. Isolations made from the artificially infected fruits resulted in all cases in the recovery of the identical organism used as the inoculum.

In 1925 more extensive studies were planned. Fresh isolations from ascospores were again made and the development and formation of the conidia studied confirming further the proposition that we were dealing with the organism described by Brooks and Black.[2]

A series of inoculations at two-week intervals were made upon Grimes Golden apples, beginning June 17 and continuing to October 1, using five conidial cultures from different sources. Another set of inoculations were made upon quince fruits. The check fruits were atomized with sterilized water at the same time and under the same conditions that the inoculum was applied. The results upon the apple have been most satisfactory in confirming the positive results obtained in 1924. Up to September 28 positive infection resulted from the first four series of inoculations on apples. The first infections occurred within the chambers about six weeks subsequent to the first inoculation, while those made outside the chambers took nearly three months, indicating that moisture may hasten infection and the subsequent development of the disease. Re-isolation of the organism has been made in all cases, and its cultural characters check with the original cultures used as inoculum. The check apples, those not atomized with the inoculum, were perfectly free from the disease.

The results on quince are somewhat doubtful, since a few of the checks showed considerable spotting. However, since the infected checks were close to the inoculated fruits, while those more removed were free, it seems probable that the questionable checks were accidentally atomized with the inoculum. The fruit spot organism was recovered from both infected checks and inoculated fruits.

The writers believe they have discovered the perfect stage of *Cylindrosporium Pomi*. The perithecia are abundant on both surfaces of overwintered leaves. They are frequently but not always grouped: black in color, measuring 70–100 microns in diameter. The asci are approximately 8–10 by 40–66 microns, containing eight 2-celled spores measuring 2.8–4.2 by 12.6–26.6, averaging 3.5 by 18.8 microns. It is quite certainly a Mycosphaerella agreeing most nearly with the description of *M. Pomi* Passer.

R. C. WALTON
C. R. ORTON

DEPARTMENT OF BOTANY,
THE PENNSYLVANIA STATE COLLEGE

[12] *l.c., vide* page 361.

[1] Contribution from the department of botany, the Pennsylvania State College, No. 53. Published by permission of the Director of the Agricultural Experiment Station as Technical Paper 405.

[2] *Phytopath.*, 2: April, 1912.