TABLE II

FIRST SINGLETS

Element	Wave length I. A. vac	I	Wave number
Ca I	4226.73	10 R	23652.4
Sc II	2273.8	5	43979
Ti III	1581.54	2	63229
V IV	1224.18	1	81687

line assigned to V IV. The accuracy of the irregular doublet law method is not great enough to distinguish among lines when several are present and the intensity is weak, for here the intensity falls regularly with increasing atomic number just as in the doublets.

Here again the intensity falls toward higher atomic numbers, as was clearly found for Sc and Ti, but the Ca group was not photographed in this work. The intensities are quoted from Russell and Saunders' paper.

TABLE III

SEXTETS

Element	Wave length I. A. vac	I	Wave number	Principal separation
	4318.65	45	23155	
	4307.74	45	23214	105
Ca I	4302.53	60	23242	
	4298.99	30	23261	52
	4289.38	40	23314	
	4283.01	30	23348	
	2563.30	2	39001	
	2560.35	3	39048	
Sc II	2555.90	2	39115	230
	2552.46	3	39168	
	2545.24	2	39279	113
	2540.94	1	39345	
	1802.97	1	55494	
	1797.10	0	55645	
Ti III	1792.58	1	55785	470
	1787.35	2	55949	
	1781.98	1	56117	158
	1777.63	1	56255	

It must be remembered that most of the tests for series relation are lacking in the extreme ultra-violet. The Zeeman effect and temperature classification of most of these lines is impossible to apply as yet. Even the outstanding intensity of these principal lines, which has been used as a guide in other elements, fails one. We are, therefore, left with little but the doublet laws, the accuracy in the application of which is not great.

My appreciation of the assistance of Dr. E. P. Clark in the preparation of the Sc is here gratefully acknowledged. These results will be discussed in greater detail eleswhere.

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STUDY ON SUGAR CANE MOSAIC[1]

DURING our investigations on the subject of susceptibility of different cane varieties to mosaic disease, a problem confronted us at the outset requiring immediate solution—that of a reliable method of inoculation. The desideratum was a method that would render the work as simple, rigid and as rapid as the work in animal pathology is rendered by the use of rats or guinea-pigs. A prerequisite of the method was, in addition, that each single individual cane should furnish material for duplicate inoculations and the relative uninoculated control. After trying many other methods with various degrees of satisfaction, some also involving the use of insect vectors, the procedure summarized below, which unites all the above-mentioned points of value, was adopted with satisfactory results.

The procedure adopted consists in obtaining, from the field, mature canes, the leaves and history of which indicate that the plant is free of disease. After having divided each cane into as many pieces as there are internodes with uninjured bud, two of the resulting seed pieces (one from the terminal and another from the basal portion of the cane) are separated and planted immediately to serve as controls. A hole is bored, in the remaining pieces diagonally into the node, immediately above the leaf scar and as close as possible to the bud, without thereby impairing this tissue. For this work a 3 mm sterile cork borer is used, the small core thus resulting being kept to seal the wound at the site of inoculation. In the hole thus prepared a small piece of fresh apical bud tissue, obtained from an infected cane, is introduced and crushed by means of a sterile glass rod. The hole is closed by means of the cork-borer core and the wound, finally, hermetically sealed with a small cotton plug soaked in melted paraffin. Planting is done soon after inoculation.

The infected tissue for inoculation should be removed from a freshly exposed apical bud only a few seconds before use, the cut being renewed for every prelevation of a new inoculum, in order to avoid undue aeration.

The results reported are hereby presented with no other intention than to show that the infective agent of cane mosaic, introduced in the tissue of the node (parenchyma and vascular bundles) is transmitted to the tissue of the apical bud and there maintained

[1] Contribution from the Chaparra Agricultural Experiment Station.

Variety of cane used	Number of experiment and of cane	Number of seed piece										
		Checks uninoculated		Inoculated								
		a	b	1	2	3	4	5	6	7	8	9	10	11
Foenix[2]	VI– 5	0	0	?	x	x	?	?	x	x				
Foenix	VI– 6	0	0	x	x	x	x	?	x	x	x			
Foenix	VI– 9	0	0	x	died	?	x	x	x	x	x	x		
Cavengerie	VIII–3	0	0	x	x	x	x	x	x	x	x	0	0	0

active for various days, even though this tissue is not, at the time, in a process of active growth.

In the accompanying table (where *0* corresponds to no infection, *x* to unquestionable and *?* to questionable infection) are reported some of the results secured in our work, the final readings being taken two months after inoculation in the case of the "Foenix" cane, and one month and ten days after inoculation in the case of the Cavengerie. The plants were grown, in this case, in an insect-proof cloth house with frequent preventive tobacco fumigations.

AUGUSTO BONAZZI

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POST-LARVAL LOBSTERS

MUCH has been learned from time to time about the life habits of adult lobsters. This is also true of lobster eggs and of young fry. It is true, however, that very little has been known about young lobsters one, two and three years of age. These animals are very seldom seen. Many lobster fishermen, for example, have never seen a two-inch lobster.

During the two summers of 1919 and 1920 the writer undertook the work of capturing some of these very young lobsters. Accompanied by my son I began testing out all sorts of places in Richmond Bay, Prince Edward Island. This body of water was selected because the water is warm and shallow and the bay is well protected in every way.

Various methods for capturing lobsters were tried. First we tried the use of small traps. These were miniature models of the regular parlor traps used by fishermen, with the exception of a few, which consisted of only one compartment.

The traps were baited and set out in water varying in depth from two to ten feet at low tide. They were put in rocky, sandy, muddy and grassy places. Quite a number of lobsters under five inches were caught in this way, one of which measured two and one half inches in length.

We also worked with a beam trawl when the weather was favorable and obtained good results in places where the bottom was soft, and covered in spots with short eel grass. A good deal of time was spent walking along shore on fine days when the water was at low tide. One day, by great good fortune, we found a place where there were some holes in the soft bottom of the ocean. After investigating many of these openings we succeeded at last in locating several small lobsters hiding in these "burrows." It was also observed that some burrows had two openings, an entrance and an exit. In such cases the openings were from six to fifteen inches apart. The lobster was therefore prepared to use either opening when attacked by an enemy.

By using all the methods indicated above we captured 280 lobsters six inches and under, 154 lobsters five inches and under, fifty-four lobsters four inches and under and four lobsters three inches and under. The smallest measured two and one half inches in length.

All lobsters taken were examined, measured and recorded and afterwards liberated away from the places from which they were obtained.

The investigation proved two things: first, that there are certain natural breeding grounds for lobsters; and, secondly, that young lobsters hide in all sorts of places, under rocks, in grass and even in burrows.

So far as I know this is the first authentic record of lobsters actually found living in burrows.

The expense of this investigation was borne by the Biological Board of Canada, and the work was done under the supervision of the chairman, Dr. A. P. Knight.

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[2] Foenix is the provisional name given to a cane, received from the Foenix gardens in Habana, which closely resembles D 74.

THE NATIONAL ACADEMY OF SCIENCES

(Continued from page 510)

Observations on the nature of ossification: W. G. MACCALLUM.

Bone is formed in the cartilage along the line of ossification of the epiphysis, but not in that of the ears or