there any real attempt being made to even encourage them to consider such an association? As far as my professional observation goes the answer is *no*. On the contrary, suggestions, and in some cases offers, by such men to devote a whole or a part of their time to this work have been met with either a flat refusal or a veiled intimation that they had outlived their usefulness. And this in view of the well-recognized fact that many of the most notable discoveries and developments in the history of science have been made by men well past sixty.

What is the explanation of this attitude? Is it because younger men fear "the wisdom which lingers after knowledge comes"? Is it because the present directors of research laboratories or the presidents of our universities realize that men who have practical knowledge of the industrial arts and of the real problems which confront our manufacturers and business men might "nip in the bud" many of the silly and useless—or at least ill-advised—"investigations" which are now being carried on by various members of their staff? Is it because of the snobbish view—not always openly expressed, but very often existent—that no one who has not received a doctor's degree, and preferably from some *foreign* institution—is eligible to a seat with the "intellectuals"? Or is it because the scramble for reputations is more controlling than the search for truth?

Whatever the reason may be, let us, at least, have an end to these senseless complaints as to the scarcity of properly trained men "in whom the love of the work is greater than the desire for wealth and power" until some proper effort has been made to avail ourselves of the services of those who are able and anxious to round out a career of financial success and usefulness in the world by devoting the closing years of their lives to research.

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FEBRUARY 27, 1929

CREPIS REUTERIANA AND ITS CHROMOSOMES

AN earlier note in this journal[1] called attention to the unfortunate confusion which had arisen concerning the identity and chromosome number of *Crepis reuteriana* Boiss. This species has now been obtained in living condition from three different localities in the Mediterranean region, and the chromosomes of two of these accessions have been examined and found to be closely similar. The number is n = 4, and the chromosomes are much larger than those of *C. capillaris*. Unlike *C. capillaris*, this species is a perennial. It is much more closely related to *C. pulchra* and *C. palaestina* than to other annual species.

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THRIPS AS CARRIERS OF FIG-DECAYING ORGANISMS

DURING the past decade the fig growers of California have suffered rapidly increasing losses due to various rots, decays and fermentations of their product, caused by cryptogamic organisms carried into the cavities of the figs by various insects. Caldis[1] shows that *Fusarium moniliforme fici* Cald., which causes a rot (endosepsis) of caprified figs, is transmitted from the wild to the edible fig by the caprifying insect *Blastophaga psenes* L. Phillips; Smith and Smith[2] list a number of insects which feed upon or enter the maturing fruit of all varieties of figs. *Carpophilus hemipterus* L. and *Drosophila ampelophila* Loew. are by these authors and other investigators considered to be the main carriers of the organisms causing two of the principal fig diseases, smut (*Aspergillus niger* Van T.), and souring, under which name is included all kinds of rots and fermentations exclusive of smut and endosepsis. *Notoxus constrictus* Cas., *Blapstinus fuliginosus* Cas., *Cnemeplatis sericea* Horn, and a mite, *Eriophyes fici* Ew., are considered unimportant as disease carriers by the authors. It has been the general consensus of opinion that where caprification is not practiced no insects enter the figs while they are green and hard. In May, 1928, the writer collected several thousand uncaprified, hard, green figs of four varieties: Calimyrna, Adriatic, Kadota and Mission, from various parts of California. These figs were cut into halves and examined with a hand lens for evidence of insect invasion, mutilated and discolored floral parts, insect excreta or the insects themselves. Slightly in excess of 20 per cent. of the figs examined were found to be infested with thrips, specimens of which were identified by Mr. Dudley Moulton, of San Francisco, as *Thrips tabaci* Lind. and *Frankliniella sp.*, probably *F. californica* Moul. The interior of two hundred of the figs showing evidence of insect invasion, and ten showing no such evidence, were cultured individually on nutrient media to determine their cryptogamic flora. Each of the two hundred thrips-infested figs yielded one or more of the following organisms: various species of Bacteria, *Rhizopus spp.*, *Aspergillus spp.*, *Penicillium spp.*, *Fusarium spp.*, *Verticillium spp.*, *Spicaria sp.*, *Hormodendrum spp.*, and a number of yeasts. The ten figs showing no evidence of insect invasion yielded

[1] E. B. Babcock, "Species of Crepis," SCIENCE, 70: 175–6, no. 1547.

[1] *Hilgardia*, 2: 287–324, 1927.

[2] Cal. Agr. Exp. Sta. Bull., 387: 1–38, 1925.

no cryptogamic flora in culture. The above results show that when green, hard figs are entered by thrips they become inoculated with organisms capable of producing various decays and fermentations in the ripening fruit. Though the 1928 season was especially favorable for thrips the comparatively high percentage of green, hard figs found infested would indicate that infection from this source alone is sufficiently great to cause the growers considerable loss. It is also possible that the early start of decay and fermentation in thrips-infested figs, giving rise to odors very attractive to *C. hemipterus* and *D. ampelophila,* is partly responsible for the appearance of these insects in the orchards at the time when figs begin to mature. This and other phases of fig diseases are being further studied by the author.

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GALBA BULIMOIDES LEA AN INTERMEDIATE HOST OF FASCIOLA HEPATICA IN OREGON

IN studies of the liver-fluke problem in Oregon a survey of the *Lymnaeidae* of the state was made. Of the five species[1] collected *Galba bulimoides* Lea was the only one which was found in every fluke-infested pasture which was examined.

Five different cercariae were observed in this species. One of these, an unarmed type, was obtained repeatedly from specimens of *G. bulimoides* collected in a fluke-infested pasture. Studies of this cercaria revealed that it agreed both morphologically and physiologically with the descriptions and photographs of the cercaria of *Fasciola hepatica.* Daughter rediae were not found. Mother rediae, obtained by crushing snails, agreed with the descriptions of redia of liver flukes. Furthermore, these rediae and cercariae were apparently identical with rediae and cercariae obtained from live specimens of *Fasciola hepatica* infested *Lymnea truncatula* Müller received from Dr. R. F. Montgomerie, of University College of North Wales, Bangor, Wales.

It was proved that these were forms of *Fasciola hepatica* by feeding encysted cercariae to guinea pigs and recovering typical liver flukes from their livers upon autopsy.

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[1] Identifications of mollusks were by Drs. H. A. Pilsbry, Paul Bartsch, W. B. Marshall, G. Dallas Hanna, A. W. Hanham and J. R. C. B. Tomlin.

THE RADIOACTIVITY OF LIGHT ELEMENTS

THE statements made in the past and repeated recently (*Lind-Chemical Reviews,* 5 (1928): 366) that no element of atomic weight less than 210 has been found to exhibit radioactivity except potassium and rubidium suggest that these exceptions may eventually be ruled out. The unknown element number 87 coming just before radium in the periodic system would probably be radioactive. This element being a member of the alkali metal family should occur with rubidium or potassium. The suggestion then may perhaps be made that whatever radioactivity is shown by specimens of potassium or rubidium is due to the presence of traces of the heavy element number 87, and that the discovery of this element should come about through the examination of radioactive rubidium or potassium.

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RAMAN SCATTERING FROM HCl LIQUID

WE have observed the Raman effect with pure hydrogen chloride liquid, at $-100°$ C., using a mercury arc and Hilger E62 spectrograph. A scattered line whose center is at 4560 A. U. persists with the incident light filtered so as to give only the 4047 line strongly, indicating an absorption band at 3.60 μ for HCl liquid. The modified line is several times broader than the unmodified line, and is more diffuse at its long than at its short-wave edge. Modified scattering of the 3.6 μ band of HCl gas was reported recently by R. W. Wood (*Nature,* February 2, 1929).

Our resolving power was insufficient for the separation of lines as close together as the rotational lines of HCl gas, but the work is being continued with better resolution. The infra-red spectrum of HCl liquid is also being measured.

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PROFESSOR HUNTINGTON'S METHOD IN CONTROVERSY

IN his latest contribution to the discussion on apportionment (SCIENCE, March 8, page 272), Professor Huntington brands as false my statement "that a certain series quotients 'would sum up to 435.'"

I wrote "the whole series would sum to 435," which is true but possibly ambiguous. By inserting the