will be with us as the bogey men of pure-race enthusiasts for the next hundred years.

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THE PLANT QUARANTINES ONCE MORE

THE article by Professor E. O. Essig in a recent number of SCIENCE[1] presents a fair statement of the point of view of those who support the program of federal and state plant quarantines which has reached its most conspicuous phase in connection with the invasion of Florida by the Mediterranean fruit-fly. And as such a statement it reveals clearly the weaknesses in the arguments of the supporters of these measures. The most pronounced of those weaknesses is the refusal of these supporters to face squarely certain disagreeable facts.

Professor Essig sums up the value of the fruit industry in the area where the fruit-fly might live and contrasts its annual crop value of an estimated $240,000,000 with the paltry sums aggregating—according to his figures—$5,250,000, which have been expended by governmental agencies in the war against the Mediterranean fruit-fly in Florida. There is in his article no intimation that this is not a full and adequate statement of the case. Nor is there any recognition of the fact that a proper accounting will charge against the quarantines and their associated measures not merely the sums of money expended by government officials in their administration but all other sums for which the quarantines are responsible.

The actual damage done by the fruit-fly in Florida through the spoiling of fruit and rendering it inedible was relatively insignificant. It was so small that it had not impressed itself upon the consciousness of the growers. But the application of the quarantines, with their restrictions upon marketing of fruit and vegetables, brought about bank losses which have been estimated at $60,000,000. I know of no estimates of the losses suffered by growers and not included in the bank losses, but surely an estimate of $5,000,000 would not be too high. We have then, instead of about $5,000,000, at least $70,000,000 to be charged up as the cost of the "protective" measures which were undertaken. This is an amount equal to more than one fourth of the annual value of the crop which is being protected. Furthermore, it should be noted that only a part of this fruit crop is subject to infestation by the fly, for the evidence indicates clearly that many fruits will not be attacked in any significant degree. It would probably be closer to the facts to estimate that the actual costs in Florida for the first year of the campaign against the fly which are to be charged up to the restrictive and control measures alone and not to the damage done by the insect are equal—on the basis of the figures given by Professor Essig—to at least one half the value of the fruit crop for one year in the area subject to infestation. And at the present writing the fly is not yet eradicated.

The ignoring of such facts as this is accompanied by an equally obtuse refusal to face certain other facts. The monetary losses of the fruit-fly campaign have been accompanied by the development of sectional bitterness that it will take long to remove and that is perhaps as important as are the financial aspects. Such effects can not be set aside as unimportant. The effect of the quarantine measures in stirring up intersectional and interstate resentments and competition outside of the normal and legitimate range of commercial rivalry is a dangerous aspect of their results. They set up what are in effect prohibitive tariff walls among the states, walls which under our national organization are not supposed to exist. They function also as prohibitive international tariffs to which consumers have every right to object.

No reference to such effects is to be found in the rosy picture of the plant quarantines which is presented by Professor Essig. Nor is any reference there to be found to the absurdities of quarantines directed against wind-borne insects, to the absurdities of intercounty quarantines, to the inadequacy of training of personnel, to the gaps that are left open by quarantine administrators, to the cost of a service to which adequate salaries would attract adequately trained men and which would permit the actual achievement of the functions for which the quarantines are presumably established. These are things which the supporters of the quarantines may discuss in private, but in public never.

That the effectiveness of the quarantines has in some cases been greatly overrated is indicated by the following example. In the mimeographed copy of a speech delivered in December, 1929, by Mr. G. H. Hecke, state director of agriculture of California, there is contained the following statement:

> For eight years the alfalfa weevil has been halted at the California line, although it jumped from the Salt Lake Valley in Utah into the Reno-Sparks district of Nevada in twenty-four months. Unrelenting quarantine vigilance has kept it from the major alfalfa-producing districts of this state.

I have available an authoritative statement of the actual facts concerning the spread of the alfalfa weevil. According to this statement the weevil was present in Salt Lake County, Utah, before 1905. It appeared in Washoe County, Nevada—which is the

[1] SCIENCE, N. S. 71: 350–353, April 4, 1930.

Reno-Sparks district—in 1920, its establishment in this county being of probably not more than a year's duration. This is an interval of at least fifteen years, instead of the two years indicated in the statement quoted. It was first found in Sierra County, California, in 1923 and in Plumas and Lassen Counties in 1925. A reference to the map of California will indicate that the insect was halted, not at the state line by the vigilance of the quarantine officials, but at the line of the Sierras in all probability by the natural barrier of the mountains.

That the plant quarantines have certain possible protective values may freely be admitted. Just how far those values extend and how to obtain them and still avoid the dangers that have been pointed out, how to obtain them at a price that has a proper relation to that which is bought, how to serve one portion of the population without infringing upon the equally just rights of another part—these are serious problems. That they can be solved and the quarantines maintained is debatable. The arguments against the quarantines are real; the solution is not to be obtained by ignoring them. It would seem desirable for the supporters of these measures to enlarge the range of their view sufficiently to include a larger proportion of the facts of the situation.

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HAIR GROWTH AND PREGNANCY

IN studying the rate of hair growth on guinea-pigs by the method of observing the regeneration of hair on shaved areas, it was noted that in pregnant females the number of hairs which regenerate reaches a minimum at the time of delivery. This observation is of special interest since the literature records conflicting observations on hair growth during pregnancy in women; references concerning increased hair growth during this period are quite as numerous as references to a retardation of hair growth or quiescence of the follicles.

In order to test the constancy of this phenomenon, the backs of a series of guinea-pigs were shaved weekly and observed over a period of six months. The amount of regeneration was computed by counting the number of follicles in the shaved area (a two centimeter square) and noting those which were active and those which were in a resting stage. This series of animals was composed of five unmated males, five virgin females, two breeding males and ten breeding females. In view of the possibility that the condition observed might be due to the cyclic or seasonal activity of the follicle, the males and the virgin females were used to control such possible factors.

The regeneration of the hair in the shaved areas in all control animals was uniform (approximately 25 per cent. of the follicles being in an active state), whereas in all pregnant females the number of hairs regenerating was noticeably less by about the third week before delivery and continued to decrease until delivery, at which time the minimum regeneration was noted (less than 1 per cent.). After delivery the follicles remained in a quiescent state for approximately two weeks. During the third week postpartum the number of regenerating hairs slowly increased and by the end of the fourth week the rate of regeneration had apparently returned to normal.

In some of the pregnant females the hair came out in quantities, leaving areas in the region of the back and sides practically devoid of hairs. This condition occurred in varying degrees.

These observations on the guinea-pig seem to indicate that there may be a negative correlation between the regeneration of hair and pregnancy. At the present time a larger series of guinea-pigs is being observed and full details of the results of experiments now in progress will be published.

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SYMBIOTIC MITES USED TO SEPARATE SPECIES OF A GENUS OF BEES

IN recent years it has been recognized that the parasites found on various species of a group of animals may be able to throw light on problems of taxonomy and general geographical distribution. What is proving to be a very interesting correlation of host and symbiont is being worked out for a group of mites of genus *Dinogamasus* and their hosts, certain carpenter-bees at present considered as members of genus *Mesotrichia* Westwood. These carpenter-bees are mainly confined to the Ethiopian and Oriental regions and one species occurs from Egypt to the northwest provinces of India.

In the first abdominal segment of the female bees there is a peculiar chamber formed by an inflated invagination of the chitinous exoskeleton. Within this pouch, or chamber, which has no opening into the body of the bee, a few or a dozen or more of the little mites may be found.

The mites which I have collected from the African bees fall into three distinct groups and their hosts seem to belong to corresponding groups. The mites examined from the Oriental regions also seem to belong to a few distinct groups all readily distinguishable from the African forms. Usually each species of bee has its own characteristic mite regardless of a wide geographic range. In some cases very closely allied bees have the same kind of mite.