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## ORNITROL: RECENT DEVELOPMENTS

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This talk today will be on recent developments with Ornitrol. All the recent developments have been with blackbirds and grackles; and, unfortunately, the man who has done the most recent work is sitting right here, so I can't steal his data very well!

We have done some work since I spoke to you last on some of the pharmacology of SC-12937--which is an axocholesterol the active ingredient of Ornitrol. One of these developments is the determination of the half-life of SC-12937, which is 28 days. This is the reason, we feel, for its prolonged activity in birds. It is stored in the liver. It is metabolized at this rate, and excreted. It interferes with several liver functions, and this is how the material takes its affect.

Ornitrol affects the synthesis of cholesterol, which is connected in turn with egg yolk formation, and also we think with egg yolk membrane formation. Recently, we have come to find that it interferes, in mammals at any rate, with lipid synthesis. Our endocrinologists tell us that it has an effect on the adrenals, which may have an effect on the pituitary and an influence thereby on estrogen production which is concerned with spermatogenesis in the male through the Sertoli cells. Some of this information is postulated, and some of it we have shown to be fact.

Mammalian data on cholesterol and the lipid levels are very adequate. Work done at Urbana a few years ago, when the material was fed for a long period of time, seven weeks, showed that a percentage of birds, on subsequent post mortem, did not appear to have any gonads; or at least the gonads could not be found. If they had gonads, they were so small and so atrophied that they could not be found. We really didn't attach very much importance to this, of course. I now realize that this wasn't very wise. But it did show that prolonged interference with the synthesis of cholesterol and lipids has a permanent effect on the ovaries in these pigeons.

Just recently, work was conducted under the auspices of the Public Health Service in Texas on sparrows. The problem there was encephalitis in man, and sparrows were implicated as being the major carriers. The public health people were interested in seeing if there was some way of diminishing the population of sparrows through a chemosterilant approach. Bait was made available to us, which we treated at the level of .1% active compound, and sent back to Public Health in Plainview, Texas, who had two colonies of English sparrows: a control group and a treated group. After seven weeks of treatment (I had anticipated they would use it for ten days), they did find an inhibition of egg-laying and of viable egg production in the sparrows. Subsequent post-mortems of rather a small number of birds revealed complete atrophy of the gonads or they couldn't be found. If they were there, they

could not be seen by the investigators, who were competent and experienced ornithologists.

We were sent liver specimens from the sparrows. Unfortunately, the material was delayed in transit; but our analytical people were able to analyze the gooey mess that remained and, indeed, found a high concentration of SC-12937 in these livers. So, here again we have established in pigeons and in sparrows a physiological process which seems to be quite clear cut. There is no reason to believe that the material doesn't have the same effect on other avians.

Another recent development comes from the United Kingdom from Dr. Murton. I don't know if he has published it or not, but it is the result of a very comprehensive study conducted at Manchester, England—an industrial town of about a million people or so with quite a pigeon population. There is a very stable pigeon population in the dock area, which Murton's group has been studying for the last several years, and they have gotten a lot of data on the composition of the population. In effect, they have found the life span of the average pigeon in the Manchester dock area to be 2.7 years. This is of great importance as far as chemosterilants are concerned, because it explains quite a few things which have happened in our investigational work in the past, particularly in Bangor, Maine, where we knocked down the pigeon population from around 2500 to about 400 in just about two years' time.

Heretofore, it has been postulated that the life span of an urban, wild pigeon is somewhere in the region of three to five years. The disappearance rate of the Bangor pigeons seemed to negate that, and I had come to the conclusion that the life span of pigeons in Bangor was somewhere around three years. Because we were able to just about knock out production in the spring of 1967, and again in the spring of 1968, the disappearance rate could only be explained by a very high mortality rate, and we were very pleased to get this information from England on this short life span. This information also gives us something to go on as to the timing of the use of Ornitrol in pigeon populations which we did not have before.

Some work has been done on bait preparation. We had to change our preparation, because it was costing us more money to produce bait than we were able to sell it for. We had to do some more work to establish efficacy and adequate acceptance at the right time of year in various geographical locations.

We have conducted work in various countries abroad--Germany, France, and Switzerland--where we have about the same results as we have gotten here in the United States. That is, efficacy for about six months in pigeons. We have found that one of the most important aspects of the treatment approach is timing. We have got to get there early in the spring before these birds really begin to reproduce. Otherwise, you get a disappointing result, as we got in Florida, where we got moving too late.

The most important things that I have to say since the last time I spoke to you is the determination of the half-life, the English determination of the life span of urban pigeons, and some information on lipid synthesis and the interfering with lipid synthesis. I think these general physiological determinations may have some importance for future control projects, and I am ambitious with regard to other species.