

# Is Genetics the Answer To Marek's Control?

• For many years, we've had a disease known as Marek's disease. It has been confounded with avian leukosis. This has plagued the industry for 40 years. There has always been the hope by those in poultry husbandry that the problem would be solved by finding a drug, feed additive, or a vaccine.

As yet, we don't have any of those things. We may have a vaccine, but as yet, not one that is generally available. I believe that prompt exploitation of the established role of heredity could have been of considerable significance in control of this disease.

**The early attempts** to use genetic selection as a means of reducing mortality from what we then called avian leukosis complex was started more than 30 years

**Ist das Marek-Problem auf dem Wege über die Genetik unter Kontrolle zu bringen?**

**Zusammenfassung**—Seit vielen Jahren haben wir es mit der als Marek'sche Krankheit bekannten Hühnerkrankheit zu tun. Unter den an der Geflügelhaltung interessierten Kreisen ist immer die Hoffnung gehegt worden, daß das Problem eines Tages durch ein Medikament, einen Futterzusatz oder durch einen Impfstoff unter Kontrolle zu bringen wäre. Bis jetzt besitzen wir noch nichts dergleichen, obwohl ein Impfstoff in Zukunft möglicherweise verfügbar werden könnte. Sofortige Nutzbarmachung der Vererbungsgesetze hätten bei der Unterwerfung dieser Krankheit eine erhebliche Rolle spielen können. An der Universität von Cornell durchgeführte Frühversuche zeigten gleich zu Anfang, daß greifbare Verbesserung in bezug auf Lebensfähigkeit und Resistenz gegen diesen Krankheitskomplex bereits nach zwei Generationen züchterischer Selektion in Erscheinung treten könnten.—Dr. R. K. Cole, Cornell University, Ithaca, New York, USA.

ago at Cornell University by Dr. F. B. Hutt, the late Dr. J. H. Bruckner, and myself. Our studies showed right at the beginning that a substantial improvement in viability and resistance to the complex could be established with only two generations of selection.

Strains of White Leghorns established then, the Cornell K and C resistance strains and the Cornell susceptible strain have been subject to continuous selection in each generation down to the present time. These strains also have been selected for improvement in economic traits that are important to the industry.

**Selection for resistance** requires that the disease be present and that other means of control not be employed. Our flocks are not protected by the use of drugs,

**La génétique est-elle la réponse au contrôle de la maladie de Marek?**

**Sommaire**—“Pendant de nombreuses années, nous avons eu une maladie connue comme la maladie de Marek. Il y a toujours eu l'espoir chez les aviculteurs que ce problème serait résolu en trouvant un médicament, un additif à la nourriture ou un vaccin qui contrôlerait la maladie de Marek. Jusqu'à présent, nous n'avons trouvé aucune de ces choses quoique nous avons peut être un vaccin. Une exploitation du rôle de l'hérédité pourrait être d'une signification considérable pour le contrôle de la maladie. Les premières études faites à l'Université de Cornell ont montré dès le début qu'une amélioration substantielle de la viabilité et de la résistance pouvait être obtenue avec seulement deux générations de sélection”.—Dr. R. K. Cole, Cornell University, Ithaca, New York, U.S.A.

**E' la genetica la soluzione al controllo della Marek?**

**Riassunto**—Sono molti anni che abbiamo la malattia conosciuta sotto il nome di paralisi di Marek. Si è sempre sperato, in avicoltura, che il problema si sarebbe risolto scoprendo un medicinale, un additivo al mangime, o un vaccino per controllare la Marek. Al momento non abbiamo nessuna di queste cose anche se possiamo avere un vaccino. Una pronta utilizzazione del ruolo ereditario prestabilito potrebbe essere stato di considerevole importanza nel controllo della malattia. Recenti studi presso l'Università Cornell hanno mostrato sin dall'inizio che un miglioramento sostanziale della vitalità e resistenza al complesso poteva essere raggiunto con solo due generazioni di selezione.—Dr. R. K. Cole, Cornell University, Ithaca, New York, U.S.A.



RANDY COLE answers questions about genetic control of Marek's at a recent poultry health and management seminar.

coccidiostats, antibiotics, disinfectants, or with rare exceptions—by any vaccines.

In recent years, we have vaccinated for bronchitis. We have never vaccinated for laryngo or for AE. We discontinued vaccination for fowl pox in 1945. We did vaccinate for Newcastle from 1948 to 1956.

In addition to the lack of this



## The profit puzzle.

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solutions to help you over the low income periods and to capitalize on the good times. By careful selection of results anyone can put together an impressive list of performance data. That's easy. But all it does is make the profit puzzle more puzzling for you. At Shaver we prefer to use the combined official Canadian and U.S.A. Department of Agriculture Summaries. Mind you, if you don't have Shaver 288 we realize you'll want the field facts too—we suggest you ask your neighbour, he has them.

So whichever way you look at it, in good times or bad, Shaver +Starcross 288 has proved herself your best bet for bigger profits. We still have a few pieces not yet placed in the profit puzzle but if anybody ever does manage to get all the pieces in the right place, it will probably be Shaver.

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*Is Genetic Resistance . . .*

procedure to control infection, we have deliberately exposed our chicks to disease by brooding them for the first 12 days of their life in an area for which the ventilation in recent years has been brought under pressure by duct. The duct originates in a house and coming through the duct is all sorts of dander and feathers from adult hens. Result: the top of the brooder is just thick with dust by the end of the season. The chicks are there for only 12 days. What we actually are doing is spreading the infectious virus of Marek's disease.

**Mortality from all** causes over the last six-year period, covering the age of 43 to 500 days of age, was 13% in the K line, 16% in the C, and more than 70% in the susceptible strain. These

**Genetic Resistance Is Good Insurance**

Although selection for resistance to Marek's disease is an effective method of control, it may not be the one choice of the future. However, for the last 30 years, we have been promised some other orthodox method of control, but as yet the industry does not have such a method it can put into force today.

Any means of controlling Marek's disease should be

exploited. The one which we know will work is selection for genetic resistance. To develop and have a stock characterized by a high level of genetic resistance is just good insurance against the possibility that the promised control measure will be delayed even longer than believed by the most pessimistic in our midst.—*Dr. R. K. Cole.*

differences are genetic. The environment is constant for all these birds.

The incidence of Marek's disease is almost nil in the K strain this year. We have had some lymphoid leukosis in the C strain

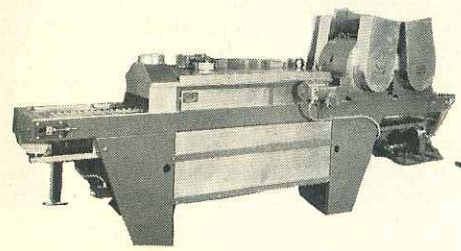
and about 55% mortality from Marek's disease already in the susceptible strain.

Can these resistant stocks be productive? Performance data on our C and K strains has been very satisfactory. C and K lines are

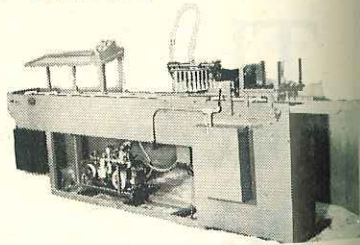
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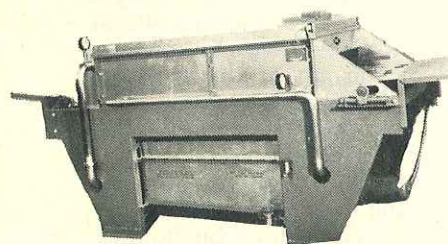
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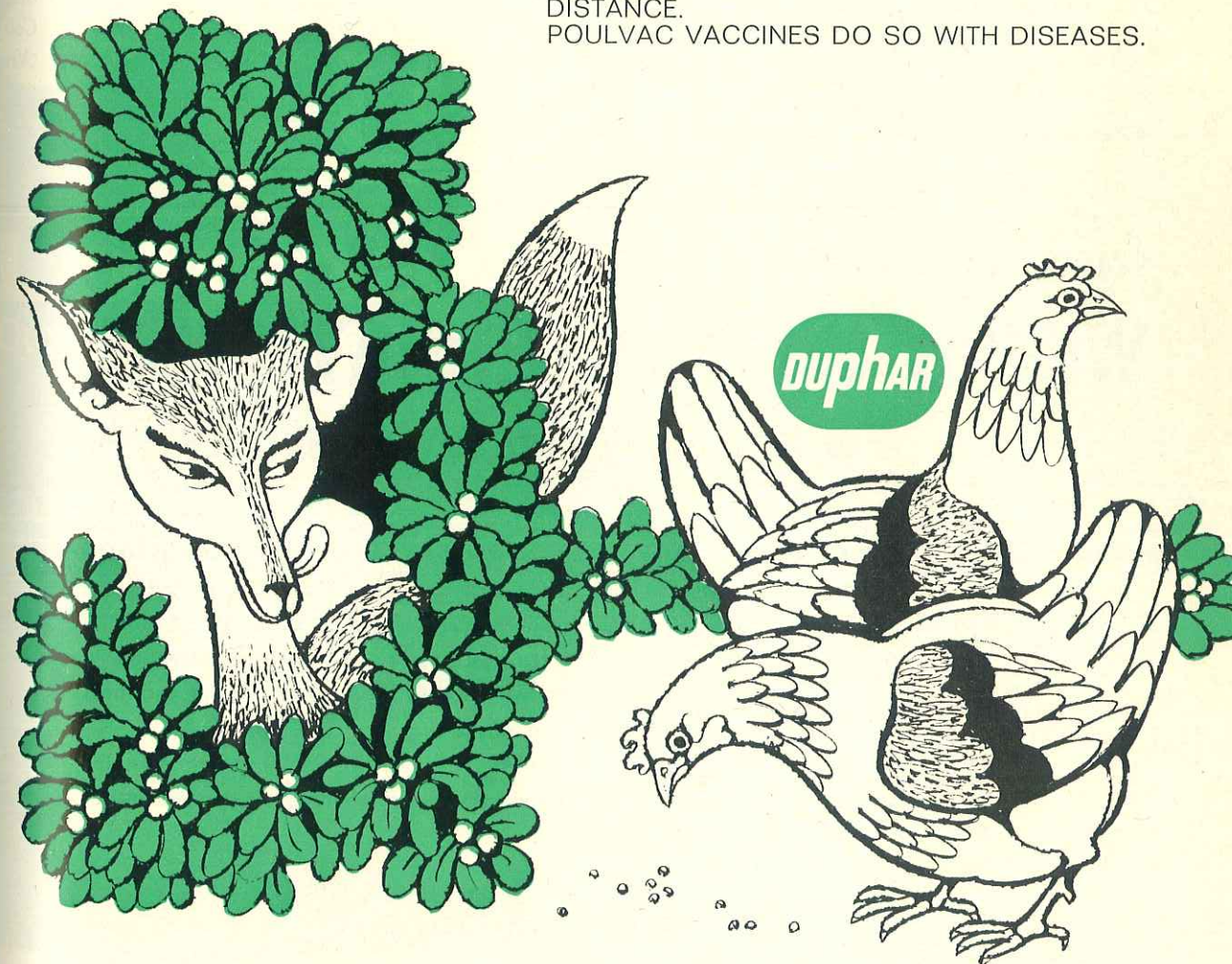
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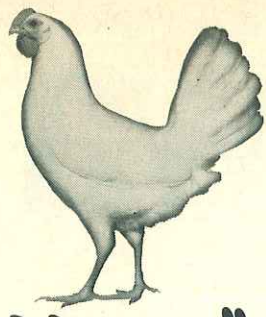
**he likes them best**

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## Genetic Resistance . . .

pure lines and their performance cannot be compared with the modern-day hybrid. Performance of the hybrid is enhanced by hybrid vigor and expressed with higher production, larger legs, and unfortunately, sometimes larger body weight. When the C and K lines are crossed, we get a boost of about 20 to 24 eggs per bird.

**Is there a way** we can speed up the process of combining resistance with economic traits for which the industry has its requirements? I admit we have spent a long time on this question. If the industry had started 25 years ago to follow this procedure, we would be better off today, but it did not.

With the advent of the transmissible strain of the Marek's disease agent, we can control the exposure by giving each bird an individual inoculation at one

day of age. If the dose is adjusted properly, we can measure the results effectively around 6 to 8 weeks of age and make a selection on this basis. This permits a test for relative resistance to be completed in a short period of time.

If we use the short term inoculation test, it is feasible in a period of 3½ months to make matings, obtain hatching eggs, hatch those eggs, test the chicks, and then make selections of potential breeders on a family basis. This makes it possible to do a selection experiment in which you complete one generation of selection, based on severely exposed and critically controlled tests and produce the next generation of parents. You can do all of these things in a one-year period.— *Dr. R. K. Cole, Cornell University, Ithaca, New York, U.S.A.*

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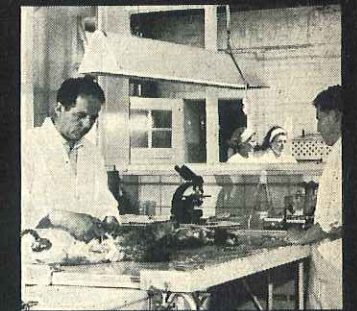
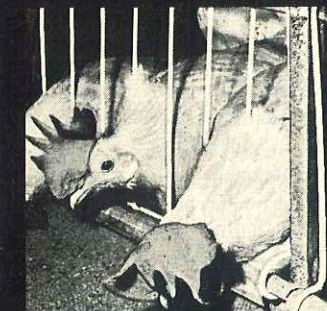
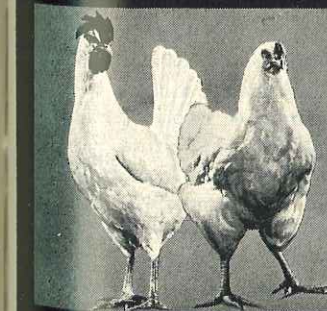
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