TOME IV. No. 1 APRIL 1931.

LIBRARY
RECEIVED
APR 3 1931
U.S. Department of Agriculture

INTERNATIONAL REVIEW OF POULTRY SCIENCE

OFFICIAL ORGAN OF THE

WORLD'S POULTRY SCIENCE ASSOCIATION

600.000 MEMBERS

18
3

EDITOR
Dr. B. J. C. TE HENNEPE
ROTTERDAM (Holland)

This Review is free to all members of the World's Poultry Science Association.

All subscriptions should be sent to the Editor: Dr. B. J. C. te Hennepe, Rotterdam or to the Secretary-Treasurer: Dr. G. F. Heuser, Cornell University. Ithaca, N.Y., U.S.A.

SUBSCRIPTIONS

One pound or equivalent ($ 5.00) annually in advance.

The **personal membership** of the W.P.S.A. amounts to	£ 1.0.0.	per year
For **affiliated societies** „ „ „	5.0.0.	per year

ADVERTISEMENT RATES

One page, per issue	£ 2.10.0
Half page, per issue	„ 1.10.0

Special attention is called for

BREEDERS' ADVERTISEMENTS

which are now fixed on **£ 2.-.- per full page, during 1 year.**

TOME IV. No. 1 APRIL 1931.

INTERNATIONAL REVIEW OF POULTRY SCIENCE

OFFICIAL ORGAN OF THE

WORLD'S POULTRY SCIENCE ASSOCIATION

600.000 MEMBERS

EDITOR:

Dr. B. J. C. TE HENNEPE

ROTTERDAM (Holland)

PRINTED BY G. B. 'T HOOFT – ROTTERDAM (HOLLAND)

THE INTERNATIONAL REVIEW OF POULTRY SCIENCE.

The First Number of the Fourth Year.

I do not think there could be a better introduction to the fourth year than the following extracts from letters and publications recently received:

ACKNOWLEDGMENT.

„The author wishes to acknowledge his indebtedness to the „usefulness of the excellent scientific abstracts contained in the **„Experiment Station Record"**, published by the office of experi- „ment stations of the United States Department of Agriculture, „Washington, D.C., and **the „International Review of Poultry „Science"**, Rotterdam, Holland. **These abstracts are so com- „prehensive, and at the same concise, that their equal could not be „duplicated, and in some instances all or parts of some of them „were used in this publication.**

„John Ruel Manning, in: *Fish Meal in animal „Feeding, with Bibliography*. U.S. Department „of Commerce, Bureau of Fisheries, Washing- „ton D.C. 1930."

„Dear Sir,

„I am very glad to receive a copy of the „International „Review of Poultry Science" the official organ of the „World's Poultry Science Association, so kindly sent by „you for exchange.

„I am glad to keep your Journal on the exchange list „to our Indian Veterinary Journal, and have mailed this „day bij separate post, a copy of the January 1931 issue to „your address.

„Hope you will be sending your Journal regularly. „With compliments,"

Yours faithfully,
P. SRINIVASA RAO, G.M.V.C.,
Mount Road P.O., Madras, India.

„Just a line to congratulate you on the part you played „in making the World's Poultry Congress such a great

„success and also **to thank you for Volume III of the „Inter-„national Review of Poultry Science"** which reached me to-„day. **It is a publication of very great interest and exceed-„ing value, and has been placed in the College Library „where the students and my other colleagues will have full „access to it."**

„With kindest regards, Believe me, Yours sincerely,

Professor F. T. G. HOBDAY,
Principal & Dean,
Royal Veterinary College,
Camden Town, London.

„I shall take great pleasure in giving your special num-„ber of the International Review of Poultry Science a „complete and thorough review in our columns in the next „month's issue of our journal. **We believe that you are doing „a great work in passing your constructive information on „to the poultry industry of the world and consider it a „privilege to work with you at all times.**

„With all kindest regards and best wishes, we are,

Yours very truly,
POULTRY CRAFTSMAN.
Claude A. Potter, Editor.

„Dear Sir,

„I have the honour to acknowledge with thanks the „receipt of **your interesting Review** no. 4.

Yours faithfully,
Director, Medical College,
Prof. Col. FROILANO DE MELLO,
Nova Goa, Portuguese India.

I very much appreciated the receipt of the International Review of Poultry Science and the invaluable abstracting service in relation to poultry diseases that it offers, and shall be only too plaesed to place the name of your Journal on our regular exchange list. We will also be pleased to further the aims of the World's Poultry Science Association by discussing your aims in this Journal and drawing attention to the publication of the International Review of Poultry Science.

Yours faithfully,
J. C. ROSS, Editor.
University of Sydney, Australia.

ROTTERDAM, April 1931.

Dear Fellow-Member,

I have the honour to enclose the first number of the fourth year of the International Review.

From the report of the meeting held in Paris you will see that the membership of the World's Poultry Science Association has increased considerably during recent years but I am of the opinion that the membership can still be increased considerably.

I think I can rely on your support in getting new members and am therefore enclosing a form of application for membership with this number and should be greatly obliged if you would return this to me filled in with the name of a new member.

At the same time I wish to draw your attention to the fact that the International Review needs the support of all members and you cannot better show your willingness to support the good work than by sending me all kinds of publications dealing with poultry, or by trying to get publishers of new books, pamphlets, or periodicals to send me copies of their publications.

For the sake of propaganda I am willing to place a number of copies of the Review at your disposal.

The publication of the Review naturally calls for financial sacrifices on the part of our cash. For this reason our work will be greatly lightened if the subscriptions for 1931 are quickly paid on request. Regarding the collection of subscriptions I am consulting the Members of Council for your country and will inform you as early as possible of the results.

Yours faithfully,

Dr. B. J. C. TE HENNEPE.

TO THE GOVERNMENTS PARTICIPATING IN THE FOURTH WORLD'S POULTRY CONGRESS

held in London, England, July 22-30, 1930.

The World's Poultry Science Association under whose auspices the World's Poultry Congresses are held wishes to transmitt to you the following resolutions which were passed at the Final Assembly of the Congress and approved by the Council of the World's Poultry Science Association.

No. 1. „That the attention of the various Governments participating be drawn to the danger of the importation of a disease known as Pseudo-Fowl Pest, with a view to suitable measures being taken for its exclusion and control in each country."

Reference is made to an article entitled Pseudo-Fowl Pest by Dr. W. K. Picard, Veterinary Institute at Buitenzorg, Dutch East Indies, January, 1930, as abstracted in the International Review of Poultry Science, Tome II, No. 4, December, 1929, page 70.

Attention is also directed to the necessity of establishing a proper quarantine of all birds returned from exhibitions, particularly from international shows.

No. 2. „That it is a matter of urgent importance that each Government should include poultry statistics in each Agricultural Census taken."

It was suggested in this connection that a standard form would be desirable and that probably the International Institute of Agriculture at Rome might be able to furnish such questions.

No. 3. „That all eggs, cold or gas stored in any European country be stamped with an internationally agreed mark, and that

steps should be taken for a meeting of authorized representatives of the European Governments concerned to be convened by the International Institute of Agriculture, Rome, as soon as possible in order to arrive at some definite agreement on the subject."

No. 4. „That the various Government Departments and Egg-Laying Competition Committees conducting Egg-Laying Competitions be asked to consider the advisability of introducing the 2 oz. (56.7 grammes) standard from the commencement of the Competition."

No. 5. „That in subsequent World's Poultry Congresses the Governments be urged to accompany each National Exhibit by a short descriptive booklet with diagrams and statistics so as to enable comparisons to be made between the development and progress of the poultry industry in the different countries."

These resolutions are submitted for your consideration and action. The World's Poultry Science Association desires to be of help in coordinating the poultry interests in the various countries and thus welcomes your suggestions and questions.

Faithfully yours,

Dr. GUSTAVE F. HEUSER,
Secretary-Treasurer,
World's Poultry Science Association,
Cornell University, Ithaca, New-York, U.S.A.

COUNCIL MEETING

Paris, 14 February 1931.

In consultation with the President, Mr. Kock, and the first Vice-President for Europe, Professor Castelló, a meeting of the Council was organized in Paris.

In order to give the Members of the Council an opportunity to prepare for the journey I circulated the following notice in December 1930.

COUNCIL MEETING.

ROTTERDAM, December 1930.

„Dear Member of Council,

„After consultation with our President, Mr. Kock, and our first „Vice-President, Prof. Castello, it has been decided to hold a meeting in „Paris during the large International Poultry Exhibition to be held there in „February 1931.

„I have written to our French Members of Council, Prof. Voitellier „and Mr. R. Caucurte, in connection with the date and place and shall „inform you further as soon as I receive their answers. As this meeting „will be of very great importance, however, I am sending you notice now „so that you will be able to make arrangements to attend.

„The following are the preliminary points of the agenda:

„1. Opening by the President, Mr. Kock, Denmark.
„2. Reports of the secretaries for England and Continental Europe, Sir „Edward Brown and Dr. te Hennepe.
„3. Report on the Society's Finances.
„4. **Report concerning the International Review and the desirability of „an Edition in French.**
„5. **Report on the World's Poultry Congress in 1933** at Rome by „Prof. Ghigi.
„6. Discussion regarding a complaint made by certain members concern- „ing the voting against conclusions of the Congress in London „by our Council.

„Remarks:

„1. **The visit to Paris will be doubly interesting** from a point of view „of the meeting and in connection with the large international poul- „try show which will be held there and which is one of the largest „held in Europe.
„2. My **activities as Secretary and Editor of the International Review**

,,involve an enormous amount of work which can only be done ,,properly if I receive the support of my fellow Council Members. ,,The International Association too, can only prosper if the Members ,,of Council take the necessary care for propaganda in their ,,respective countries. Although I have received loyal support from ,,many Members of Council there are still several who appear ,,to consider their work as a kind of honorary position and do not ,,even take the trouble to answer my letters, while, moreover, ,,I notice nothing of any work being done in their countries. This ,,is in my opinion an unsatisfactory state of affairs. In this way the ,,Association suffers and the representation of the country concerned ,,also. What can be done in this question?

,,3. **The Congress Editions of the International Review,** which were ,,printed in English and French, cost a deal of money and this has ,,led to an unfavourable financial position for 1930. If all members ,,in Europe had paid directly when I requested them this would have ,,prevented many difficulties. There are still members, and even ,,Members of Council, whom I have written four times, but who have ,,neither answered my letters nor sent money. This causes me ,,a great deal of work as well as cost of postage etc. Such a con- ,,dition of affairs, in my opinion, should not exist. I shall give ,,you further information together with the names of members, who ,,have failed to pay their subscription for 1930 at the meeting.

,,4. **Edition in French.** An edition as the last one (Tome III, No. 3) ,,costs in Holland for printing, paper etc. about $ 500.—. The cir- ,,culation is about 1000 copies, but as the cost of printing a smaller ,,number remains the same, the total cost for a small French edition ,,would not be less.

,,We have now about 450 English reading members and about ,,**50 who prefer the periodical to be printed in French.** The majority of the ,,**latter only pay half the subscription so that it is now impossible to pay ,,a French edition.** Moreover it is not possible to publish both an English ,,and a French Edition simultaneously. I did this in July, but while I was ,,busy with it, I had no time for any other work. **An edition in French is ,,however, very desirable** and I should like to discuss this point at the ,,meeting.

,,**Correspondence.** It appears to me that in various countries, the ,,languages of which I do not know, such as, in North-, East- and South- ,,East Europe, Russia, literature is published of which a resumé would be ,,of interest to many of our members. I think we ought to make some ,,,attempt, through the intermediary of our Members of Council in those ,,countries, to obtain correspondents who would send me resumés regularly.

,,**Advertisements.** The financial position of the Association would be ,,considerably improved if we could only get more advertisements for the ,,International Review.

,,5. We hope that **Prof. Ghigi will be present** at the meeting and that ,,he will give us some information regarding the measures already ,,taken in connection with the World's Poultry Congress in Rome ,,as well as with regard to plans which can be made for the future.

,,In view of these discussions your presence at the meeting will be ,,of great importance to your Country.

Yours faithfully,

Dr. B. J. C. TE HENNEPE.

Secretary for Continental Europe,

To our great satisfaction the following officers attended the meeting:

Honorary Past President, Dr. Sir Edward Brown, England; President, Mr. W. A. Kock, Denmark; First Vice-President for Europe, Professor S. Castelló, Spain; Vice-Presidents, Mr. P. Francis, England; Professor A. Ghigi, Italy; Mr. R. Römer, Germany; Professor Chas. Voitellier, France.

The following Members of Council were present: Australia, Mr. J. B. Merrett; Belgium, Mr. Jules Maenhout; Denmark, Mr. J. Traberg; England, Capt. E. J. Halnan; France, Professor P. Lesbouyries, Mr. René Caucurte; Holland, Dr. B. J. C. te Hennepe; Scotland, Mrs. H. Maciver.

The meeting therefore, consisted of 15 members representing 11 countries.

The following Members of Council gave notice of their inability to attend the meeting: Mr. K. Kleb, Switzerland; Prof. G. S. Chlebaroff, Bulgaria; Miss Paroubkova, Czechoslovakia; Prof. B. Mangold, Hungary; Mr. Einar Bö, Norway; Mr. James E. Gordon, Northern Ireland; Miss A. Kinross, Scotland; Prof. Dr. L. de Blieck, Holland; Mr. Tom Newman, England; Prof. Pirochi, Italy; Mr. A. Wachenfeldt, Sweden.

Through the kind intermediary of our Members of Council Professor Voitellier and Mr. Caucurte, I was able, on the 13th January 1931, to send the following notice to the members:

„Meeting of Council: Saturday 14th Feb. 10.30 a. m. Room:

„Pavillon de l'Administration du Parc des Expositions de la Ville „de Paris à la Porte de Versailles.

„The Société d'Aviculture de France" has the honour to invite „Members of Council and their Ladies for the Banquet on Friday, 13th „Febr. Hotel Lutétia, 19,30 p. m.

„Please send me your name by return post."

Before giving a report of our meeting I wish, on behalf of the World Poultry Science Association, to express our heartfelt thanks to the Société d'Aviculture de France, for the honour shown to us by the invitation to this splendid banquet. The Members of Council enjoyed the honour of being addressed by the President of the Banquet, His Excellency Monsieur Tardieu, Minister of Agriculture. Professor Ghigi, Director of the World's Poultry Congress to be held in Rome, 1933, replied to the Minister's speech on behalf of the Association.

During the course of the banquet we were informed that Monsieur Doumergue, President of the French Republic, would visit the exhibition at 10 o'clock the next morning and that Professor Voitellier would present the Members of Council to the President during his visit.

Afterwards the meeting was opened in one of the rooms kindly lent us by the Committee of the Exhibition to whom we now wish to express our sincerest thanks.

Professor Castelló introduced the new President of the World's Poultry Science Association, Mr. W. A. Kock to the meeting who welcomed those present, especially Mr. J. B. Merrett from Australia.

Mr. Kock then asked Professor Ch. Voitellier to take the chair for this meeting.

Point 2 of the Agenda: Sir Edward Brown referred to the great influence that the World's Poultry Congress in London had exercised on the development of Poultry farming in England and in other countries. The membership in England had increased considerably. A remarkable fact is that Ireland, with only 4,000,000 inhabitants, has almost as large a membership as England, which has ten times this population. Sir Edward also stated that the International Review has done much towards increasing the membership of the Association.

Mr. Merrett expressed his thanks for the kindly welcome accorded to him by the President and stated that he had written articles in the Australian Poultry papers regarding the work of the World's Poultry Science Association and he expects that the number of members in Australia will also increase.

Professor Castelló stated that the Association has now got a strong ally in South America in the person of Professor E. Llovet, Member of Council for Uruguay. He also informed the meeting that he intends to pay a visit to South America in order to urge participation in the Congress to be held in Rome and to try to increase the membership of the Association.

Dr. te Hennepe then spoke of the position of the Association in Europe. He referred to what he had already stated in the notice convening the meeting and drew attention to the pleasing fact of the great interest shown in several countries. In French, German and South African papers propaganda is being made for the World's Poultry Science Association by Members of Council and he

took this opportunity of thanking those Members of Council. His work, which demands a great deal of time and untiring enthousiasm, is sometimes made more difficult by some Members of Council to whom it is necessary to write more than once in order to get an answer from them. He considers this an undesirable condition of affairs and hoped that the Members of Council concerned would take a more serious view of their work. Membership of the Council should not be looked upon merely as an honour. It carries certain obligations with it, among others, that the member should advertise the W.P.S.A. as much as possible in the country he represents and support the Central Committee to the best of his ability in their difficult task. Great activity of the Members of Council is of importance to the country they represent so that a closer international co-operation is maintained with the men of science in other countries. As there are sometimes days on which he has to write 30 letters in various languages and to various countries Dr. te Hennepe would be greatly pleased if members would not put unnecessary difficulties in his way with regard to the collection of contributions.

For the purpose of promoting international contact he has had several interviews with representatives from various countries and has also made trips to France, Belgium, Germany and Denmark. At the exhibitions and meetings in Hannover and Copenhagen he had, with other Members of Council, represented the W. P. S. A. He expressed his thanks to the Danish Poultry Society „Danmarks Fjerkraeavler Forening", who, at their meeting in December last, awarded the „Golden Medal for Service" to the following Members of the W. P. S. A.: Mr. F. Elford, Canada; Professor Castelló, Spain; Mr. P. Francis, England; Dr. te Hennepe, Rotterdam.

The rapid increase in the number of Individual Members during recent years gives great cause for satisfaction. From the table in the International Review, Tome III, No. 4, it will be seen that the number increased from 139 on the 1st January 1928 to 222, 374 and 512 on the 1st January in the years 1929, 1930 and 1931 respectively.

An untrue statement published in one of the German Poultry papers in connection with the last Meeting of Council in London has meanwhile been corrected by the Vice-President, Mr. Römer.

Point 3 of the Agenda: Finances of the W.P.S.A.

The Report of Dr. G. F. Heuser, Secretary Treasurer, during 1930, reads as follows:

FINANCIAL STATEMENT OF THE WORLD'S POULTRY SCIENCE ASSOCIATION for 1930.

Balance January 1, 1930	$ 318.57
Receipts	
Subscriptions	$ 1.163.30
Balance from E. Brown	„ 558.21
International Review	„ 48.50
	$ 2.088.58
Expenditures	
To Dr. te Hennepe (Int. Review)	$ 1.800.00
Printing and Envelopes	„ 58.00
Secretary's Expenses	„ 37.76
Postage	„ 29.76
Exchange	„ 1.97
Office Supplies	„ 4.50
	$ 1.931.99
Balance January 1, 1931	$ 156.59

From this report it appears that the expenses in connection with the publication of the International Review are the heaviest. These were exceptionally high in 1930 owing to the fact that in connection with the World Congress in London, an extra congress Edition in the French language was published and the number of copies in the English language was increased from 1.000 to 3.000. In normal years the cost of 1.000 copies amounts to about fls. 1.250 which can be checked from the following expenses for 1930:

Tome II, no. 4, Dec. 1929: Printing & Shipping	fls. 1014.—
Tome III, Nos. 1 & 2, July 1930.	
French Edition, 1000 copies, 128 pages	1437.—
English Edition, 3000 „ 112 „	1980.—
Tome III, No. 3, Oct. 1930, Printing & Shipping	1308.—

In the present circumstances, therefore, it is impossible to publish both an English and a French edition. It is quite possible that the cost would be lower if the printing and publishing were done in Paris but this will have to be investigated.

A very unpleasant fact is that, in spite of repeated requests, some members have not paid their contributions for 1930. The International Review has been sent them regularly, **so that they have profited from the work of the International Association without paying the money due.** According to a resolution taken at a former meeting, they will not receive the International Review during 1931 and, moreover, according to the regulations their membership will be cancelled in 1932.

In view of the unfavourable financial position in many countries the resolution taken at the Committee Meeting in London, by which the subscription for countries which are Patrons should be raised to £ 20 per year, appeared to the speaker to be rather dangerous and he would ask the meeting not to carry out this resolution until a meeting, to take place during the Congress in Rome in 1933, shall have given a further decision.

To this the meeting agreed.

Point 4 of the Agenda: French Edition of International Review.

As a result of the report regarding a French edition of the International Review contained in the notice convening the present meeting, the Secretary had received several letters, containing remarks on this point. Some countries were of opinion that an edition in the French language was not yet necessary in view of the small number of French speaking countries. The majority of the countries are, however, in favour of a French edition provided the finances of the Association can bear the cost. German members pointed to the fact that the membership in Germany is larger than that of all the countries desiring an edition in French so that an edition in German might be requested on these grounds.

After a lengthy and animated discusssion in which practically all those present took part, it was decided that there can be no question of a French Edition until the finances of the Association could stand the cost. The desirability of a French Edition was generally acknowledged but the present financial position of the W.P.S.A. did not allow of it.

Professor Lesbouyeries pointed out that he publishes a scientific periodical in the French language, the cost of which is paid by the advertisements obtained and suggested that an edition of the International Review in French along these lines might also be considered.

Professor Ghigi offered to take the cost of 50 copies of a

French Edition for his account. If the other countries interested in an edition of the International Review in the French language were to do likewise a start could be made at once.

Finally it was decided that a **commission should study the possibility of an edition in the French language** and publish their report as early as possible. The following were appointed members of this commission: Professor Castelló (Spain), Professor Lesbouyeries (France), Mr. J. K. Maenhout (Belgium).

Sir Edward Brown moved that breeders in the various countries should be allowed to advertise in the International Review at a cost of £ 2 per annum. The motion was accepted.

Point 5 of the Agenda.

Report on the World's Poultry Congress in Rome by Professor Ghigi.

Professor Ghigi first spoke of the exhibition. The chief point in this connection is the site where the exhibition shall be held. It will be difficult to rent a very large space in Rome itself but a site could be obtained about 6 K.M. from the city. With a view to the visits of the public from Rome this is, however, undesirable. For this reason an historically interesting building, the **Forum Trajani** and the **Thermes of Diocletianus** might be considered suitable. The Congress could then be held in one of the schools quite near the Forum where there are some very suitable rooms.

In view of the space available it would be necessary to limit the entry from each country to 2 trios of hens of each variety or two couples of pigeons or rabbits, as was done at the exhibition in The Hague.

Professor Ghigi requested that Messrs. Kock, Castelló and te Hennepe should pay a visit to Rome in the first week of April next, in order to study the sites for the exhibition and congress and moved that the meeting empowers him, on consultation with these gentlemen, to determine the sites. This motion was carried unanimously.

Several members of the meeting spoke of the arrangements of the Congress. One of the chief points was treated by **Mr. Römer,** namely, that if various sections are held simultaneously, it it not possible to attend important lectures which will have to be given simultaneously. Mr. Römer urged the limitation of the number of reports and also that the time at which a report was to be discussed should be most accurately given.

After a lengthy discussion it was decided that this point should be given further consideration, the more so as Professor Ghigi has already conducted several international scientific congresses and is of opinion that he will be able to solve the difficulties.

The apportioning of the Members of the Congress over various sections appears to him to be undesirable.

The view of the travel facilities for American visitors **it was decided to hold the Congress about the middle of September**. The official languages will be: Italian, Spanish, French, German and English. The official invitations to the Governments of the various countries will be issued very shortly.

In view of the lateness of the hour it was decided to **postpone discussion on point 6** of the agenda until the following meeting which will perhaps be held in Hannover in the Autumn.

Mr. Römer discussed the desirability of arranging, through the intermediary of the W.P.S.A. for an interchange of poultry experts between the various countries. This idea was unanimously favoured.

After the President, Mr. Kock, had thanked those present for their attendance and had, on behalf of the W.P.S.A., expressed thanks for the hospitability shown in connection with **the Banquet** and **presentation of free tickets for the Exposition by the Committee of the Exhibition,** this important meeting was closed.

The members then adjourned to the Exhibition Restaurant where a pleasant lunch was served.

THE INTERNATIONAL REVIEW OF POULTRY SCIENCE IS EXCHANGED WITH THE FOLLOWING 76 JOURNALS. WHO FOLLOWS?

AUSTRIA. NUTZGEFLUEGELFREUND, Franz Josefs Kai 7-9, Wien I.

GEFLUEGELWIRTSCHAFT, Lichtenauergasse 5, Wien II.

OESTERREICHISCHE TIERARZT, Wallnerstrasse 6, Wien.

OESTERREICHISCHES ZENTRALBLATT, Passauerplatz no. 2, Wien.

ZENTRALBLATT FUER KLEINTIERZUCHT, Riemergasse no. 6, Wien.

AUSTRALIA. THE AUSTRALIAN VETERINARY JOURNAL, The Veterinary School, University of Sydney.

AUSTRALASIAN POULTRY WORLD, 78a Victoria Str., Melbourne.

POULTRY, Sydney, N.S.W. 32.

VICTORIAN POULTRY JOURNAL, Melbourne, Vic.

BELGIUM. AVISELECT, Rue Emm. Mertens 29, Bruxelles, Woluwé.

BULLETIN OFFICIEL, Les Colombes, Heide-Calmpthout.

CULTURA, Mr. Kessler, Nieuwstraat, Capellen.

LAND, TUIN EN NEERHOF, Baliestraat 97, Gent.

HET VLAAMSCH PLUIMVEEBLAD, Brussel, Woluwe.

VLAAMSCH PLUIMVEEBLAD, Rue Emm. Mertens 29, Brussel-Woluwé.

CANADA. THE CANADA POULTRYMAN, 618 Homer Street, Vancouver.

THE CANADIAN POULTRY JOURNAL, Toronto 12.

THE CANADIAN POULTRY REVIEW, 184 Adelaide Str., W., Toronto.

ENGLAND. CHANTICLEER, E. Hugh Hudson, Chilworth near Guildford.

EGGS, Rudgwick, Sussex.

THE FEATHERED WORLD, 9 Arundel Street, Strand, London, W.C. 2.

HARPER ADAMS POULTRY JOURNAL, Newport.

LANCASHIRE UTILITY POULTRY SOCIETY'S REPORT, Richard Green, Farringdon Park, Preston, Lancashire.

MEMOIRS UNIVERSITY OF CAMBRIDGE, Department of Agriculture, Cambridge.

NATIONAL POULTRY JOURNAL, Milford, Surrey.

POULTRY WORLD, Link House, 4-8, Greville Street, London, E. C. 1.

THE JOURNAL OF THE MINISTRY OF AGRICULTURE, 10 Whitehall Place, London.

UTILITY RECORD, Official Organ of the National Utility Poultry Society, 53 Victoria Street, London, S.W. 1.

FRANCE. LE PETIT JOURNAL AGRICOLE, 61 Rue Lafayette, Paris.

LA REVUE AVICOLE, 34 Rue de Lille, Paris.

GERMANY. ARCHIV FUER GEFLUEGELKUNDE, Kaiser Wilhelmstr. 66, Berlin-Nieder Schönhausen.

DEUTSCHE GEFLUEGEL-ZEITUNG, Vaihingen a. d. Enz.

DEUTSCHE LANDWIRTSCHAFTLICHE GEFLUEGEL-ZEITUNG, Steinmetzstr. 2, Berlin.

EIER-BOERSE, Nürnbergerstr. 28, Berlin.

GEFLUEGEL—WELT, Georgstrasze 38/33, Hannover.

GEFLUEGEL—BOERSE, Solomonstr. 16, Leipzig.

GEFLUEGEL—FARMER, Lützner strasse 29, Leipzig.

ZUECHTUNGSKUNDE, Nikolausberger Weg 9, Göttingen.

HOLLAND. AVICULTURA, Misset, Doetinchem.

BEDRIJFS-PLUIMVEEHOUDER, Doetinchem.

DE KLEINVEETEELT, Heerenveen.

SCHAKELS, Maasstraat 106 II, Amsterdam (Z.).

TIJDSCHRIFT VOOR DIERGENEESKUNDE, Prins Mauritslaan 9, Den Haag.

INDIA. THE INDIAN POULTRY GAZETTE, Narayangunj, E. Bengal.

THE INDIAN VETERINARY JOURNAL, P. Srinivasa Rao, Madras.

IRISH FREE STATE. JOURNAL OF THE DEPARTMENT OF AGRICULTURE, Dublin, C. 17.

ITALIE. BASSA CORTE, Salita Inf. S. Tecla 36, Genova.

JAPAN. JOURNAL OF THE JAPANESE SOCIETY OF VETERINARY SCIENCE, Prof. Naoshi Nitta, Faculty of Agriculture, Imperial University, Komaba, Tokyo.

NETHERLANDS-EAST-INDIA. LANDBOUW EN VEETEELT, Petjenongan 72, Weltevreden.

N. I. BLADEN VOOR DIERGENEESKUNDE, Bataviasche weg 54, Buitenzorg.

SOUTH AFRICA. THE JOURNAL OF THE S. A. VETERINARY MEDICAL ASSOCIATION, 61 Simmondsstreet, Johannesburg.

THE S. A. POULTRY MAGAZINE, Whiteco House, Box 286, Bloemfontein. S.

SPAIN. MALLORCA AGRICOLA, Granja Barcino, Consell-Baleares.

MUNDO AVICOLA, Arenys de Mar, Barcelona.

SWEDEN. SVERIGES ALLMäNNA FJäDERFäAVELS FöRENINGS TIDSKRIFT, Garvaregatan 7, Stockholm.

SWITZERLAND, DIE TIERWELT, Zofingen.

UNITED STATES OF AMERICA, ALABAMA NATIONAL EGG LAYING DEMONSTRATION, Progress Report. Alabama Polytechnic Institute, Auburn, Alabama.

AMERICAN POULTRY JOURNAL, 523 Plymouth Court, Chicago Ill.

THE BABY CHICK, 1230 West Washington Boulevard, Chicago.

EXPERIMENT STATION RECORD, U. S. Department of Agriculture, Washington, D. C.

GOLDEN BUFFS. New Albany, Indiana Bruce W. Ulsh, Owner.

HATCHERY TRIBUNE, Mount Morris, Ill.

HINTS TO POULTRYMEN, Agric. Exp. Station, New Brunswick, N. J.

INTERNATIONAL BABY CHICK NEWS, 3223 Troost Ave., Kansas City, Mo.

NEW ENGLAND POULTRYMAN, 4 Park Street, 2. Boston, Mass.

NEW JERSEY AGRICULTURE, Rutgers University, New Brunswick, N. J.

OHIO AGRICULTURAL EXPERIMENT STATION, BIMONTHLY BULLETIN, Wooster, Ohio.

"OK" POULTRY CULTURE, 2607 North Boston Place, Tulsa, Oklahoma.

POULTRY CRAFTSMAN, 327 Towne Avenue, Los Angeles, California.

POULTRY PROJECT BULLETIN, Mich. State College of Agriculture, East Lansing, Michigan.

POULTRY SCIENCE, L. E. Card, Urbana, Ill.

POULTRY TRIBUNE, Mount Morris, Ill.

POULTRY ITEM, Sellersville, P.A.

RELIABLE POULTRY JOURNAL, Dayton, Ohio.

U. S. EGG AND POULTRY MAGAZINE, 110 North Franklin Street, Chicago.

BREEDING

The Inheritance of Black and White in Rose Comb Bantams. A Pioneer Cross in Poultry Genetics, illustrated by Photographs. Morley A. Jull, Joseph P. Quinn. Journal of Heredity, Organ of the American Genetic Association, Washington, D.C., Vol. XX, No. 8.

The manner in which the characters black and white are inherited in a cross between Rose-Comb Black and Rose-Comb White Bantams will serve to illustrate the mechanism involved in the inheritance of most pairs of characters. The first and the only reference to such a cross having been made is reported by Bateson and Punnett in 1908. The same authors reported that the White of the Rose-Comb White Bantam is recessive to color.

Jull and Quinn in this brochure give the results of reciprocal crosses involging Rose-Comb White and Black Bantams secured at the U.S. Animal Husbandry Experiment Farm, Beltsville, Maryland. Also are given the photographs of birds used in the various matings.

A Simple Linebreeding Program for Poultry Breeders. C. W. Knox, Agricultural Exp. Station, Ames, Iowa. Bulletin no. 258, 1929,

Summary:

1. High egg production is inherited.
2. Linebreeding seems to be the best form of breeding.
3. Linebreeding can be accomplished without trap nesting or the keeping of complicated records.
4. The foundation male must be a pedigreed one.
5. The foundation male's pedigree must show successive improvement and high egg production for at least three and preferably four generations.
6. The colony eggs must be marked and kept separate.
7. The chicks should be toe-punched for later identification.
8. A simple method of linebreeding can be accomplished by mating a son of the foundation male to the granddaughters of the foundation male.

Sex Differences in the normal Growth Rate of Chicks. C. W. Ackerson and F. E. Mussehl, Nebraska Agric. Exp. Station. Journal of Agricultural Research, 1930, p. 863.

Summary:

The growth data of 397 male and 403 female Single Comb White Leghorn Chicks from 1 to 9 weeks of age have been subjected to a statistical examination. Differences in the mean weight of male and female chicks are significant at 1 week of age, and the significance increases thereafter.

A factor is suggested for use in bringing lots with different numbers of male and female chicks to a common basis for the purpose of comparison.

Early Growth of White Leghorns. Walter A. Hendricks, A. R. Lee, Harry W. Titus. U.S. Dep. of Agriculture, Bureau of Animal Industry. Poultry Science, Vol. VIII, p. 315.

Summary and Conclusions:

Data on the early growth (first 14 to 15 weeks) of nine lots of White Leghorn chicks, hatched at different seasons of the year and given similar treatment, are given. The rations were such as would enable the birds to make satisfactory growth but are not **strictly** comparable because of minor differences in composition. An estimate of the average growth made by the nine lots of chicks, between the time of hatching and various ages up to fifteen weeks, was made by fitting the equation of the curve which describes the course of an autocatalyzed, monomolecular, chemical reaction to these data. Charts are presented to show the variability in growth made by the nine lots of chicks. The root-mean-square deviation, the coefficient of deviation, the average positive and negative deviations, and the average positive and negative percentage deviations from the calculated average live weights were calculated and are presented in tabular form.

The calculated average growth made by our chicks was compared with published data. In general, the growth made by our chicks was less for the first seven to ten weeks but thereafter it was greater. The differences may be due to the fact that our chicks were reared on concrete floors under conditions of partial confinement instead of being allowed to run on a range; it is also possible that the feed received by our chicks for the first one or two weeks was not so suitable for growth as that received by the chicks referred to above.

Studies in Hatchability. Morley A. Jull. Bureau of Animal Industry, U.S. Dep. of Agriculture.

II. *Hatchability in Relation to the Consanguinity of the Breeding Stock.* Poultry Science, Vol. VIII, p. 219.

Conclusions:

Full-brother-and-sister matings and half-brother-and-sister matings tend to decrease hatchability by increasing both the percentage of embryos dying during the period from the first to the seventeenth days and the percentage of embryos dying between the eighteenth and twenty-first days of incubation.

Such close inbreeding affects embryo mortality from the eighteenth to the twenty-first days of incubation to a greater extent than embryo mortality from the first tot the seventeenth days of incubation.

Hatchability results are affected to a greater extent in the first year of inbreeding than in successive years, though there is a general decline in hatching results each year that such close inbreeding is continued.

III. *Hatchability in Relation to Coefficients of Inbreeding.* Poultry Science, Vol. VIII, p. 361.

Summary:

Hatchability decreases as the coefficients of inbreeding increase.

Usually the greatest relative decrease in hatchability occurs between a coefficient of inbreeding of 0 and 12.50.

As the coefficients of inbreeding increase the decrease in hatchability is greater in the Barred Plymouth Rocks than in the White Leghorns used in this study.

The same coefficients of inbreeding, regardless of the year in which they are produced, do not give significant differences in hatchability results.

Continuous full-brother-and-sister matings are more detrimental to hatchability than full-brother-and-sister matings alternated with half-brother-and-sister matings.

IV. *The Effect of intercrossing inbred Strains of Chickens on Fertility and Hatchability.* Poultry Science,, Vol. IX, p. 149.

Since the intercrossing of highly inbred strains of corn produces a remarkable state of rejuvenation it was decided to determine the effect of intercrossing the inbred strains of Barred Plymouth Rocks and White Leghorns.

The results secured from the White Leghorns are in general agreement with those secured from the Barred Plymouth Rocks.

The inbred strains when crossed produced a significantly lower percentage of fertility.

The data on hatchability show that in both the intercrossed inbred breeds the percentage of hatchability is significantly higher than in the inbred matings. The term heterosis, meaning hybrid vigor, has been given to the condition of rejuvenation resulting from the crossing of inbred strains.

Incubation and Brooding. Geo. P. Goodearl, N. Dak. Agric. College, Fargo, North Dakota, Circular 87.

Contents:

Selection of Hatching Eggs. Location of Incubator. Incubator Sanition. Running the Incubator. Ventilation and Moisture. Turning and Cooling Eggs. Care of the Lamp. Testing the Eggs. Taking of the Hatch.

Brooding: Brooder House. Stoves. Sanitation. Litter. Test Equipment. Temperatures. Moving Chicks to Brooder. Feeding Baby Chicks. Milk and Green Feed. Use of Cod Liver Oil. Chick Range.

Some Observations on Battery Brooding. C. S. Platt, New Jersey Agriculture, Febr. 1930.

The system has been used at the experiment station, New Brunswick, for two years. Sometimes results have been very satisfactory whereas at other times the opposite has been true. Follows: Description of the advantages of Battery Brooding, and Problems to solve. In combatting toe picking and tail picking the dimming of the light was effective. Feathering has been a difficult problem, and at times some of the chicks have been 12 to 14 weeks old before being completely feathered. With hock disease and feathering completely controlled, battery brooding will be greatly improved.

Influence of feeding: An all mash ration was recommended and allthough it proved quite satisfactory for White Leghorn Chicks, the heavier breeds did not respond as well as they should and severe cases of hock disease appeared in some instances.

Several important features are still in an experimental stage. The advantages obtained however are clear cut and sound, so that there is very little doubt but that the system eventually will be perfected.

The accredited Hatchery and Flock Plan in the State of Illinois. Department of Agriculture, Division of Poultry Husbandry, Springfield, Ill.

Contents:

The Plan Hatchery Requirements and Regulations. Requirements for Standard Accredited Flocks. Requirement for Standard Accredited Eggs. Require-

ments for Standard Accredited Chicks. Trade Mark Regulations. Fees and charges. Certificates. Reserve Lists. Etc.

Appendix. Accredited Flocks free from Pullorum. How to cull your Flock. State Standard Accredited Information. Rules for Poultry Inspectors.

The Fertilization of Hen's Eggs. Professor G. S. Chlebaroff, Sofia. Poultry World, Nov. 7, 1930.

Since opinion is still very much divided on the question of the fertilization of hen's Eggs, a few tests were undertaken

The object of these tests was to elucidate the following questions:

1. At what time is the last fertilized egg laid after the cock has been removed?
2. When are the first and last fertilized eggs laid after one single pairing?
3. How many eggs are fertilized at one single pairing?

To this end the Central Laboratory for Poultry Culture at Sofia arranged for three tests with 44 test fowls taken from American Leghorn, Black Minorca. Black Shumenka and White Sevlievka. The fertilization of the egg was verified by means of the incubator and in doubtful cases also with the magnifying glass The results may be tabulated as follows:

1. An egg laid the day immediately after the pairing is always non-fertilized.
2. The first fertilized egg is laid as early as the second day after the pairing. If the hen did not lay on the second day, then the first fertilized egg was laid on the third, fourth or fifth day.

The first fertilized egg was laid:

In 26 cases on the second day (66.6 per cent).

In 8 cases on the third day (20.5 per cent).

In 2 cases on the fourth day (5.1 per cent).

In 3 cases on the fifth day (7.6 per cent).

It did not make any difference, apparently, whether the pairing took place in the morning or in the evening.

3. The last fertilized egg after one pairing was laid by the majority of the test hens in the course of the second week (38 cases = 77.5 per cent); only by two hens (4 per cent) at the end of the first week; and by nine hens (18.4 per cent) in the course of the third week and not later than the 19th day (2 cases) after the pairing.

The small number of fertilized eggs laid by some of the test hens is to be attributed to the fact that the hens in question stopped laying.

4. The number of eggs fertilized at one pairing varies greatly and depends on the intensity of the hen's laying activity as well as on the intensity of the cock's sexual impulse. With our test hens this number amounted up to 8 eggs.

Poultry Breeding in Italie. Allevamenti consorziali avicoli presso la Regia Scuola Agraria Media di Roma. Federico Clementi. Rome, 1928.

Description of the arrangements of the breeding stations in Italy. Regulations and demands with which the breeding stations must comply.

Teaching and Organization in modern Poultry-Breeding. L'Insegnamento e l'Organizzatione basi della Pollicoltura moderna. Federico Clementi. Rome. 1929. Regia Scuola Agraria media di Roma.

Description of conditions in Poultry-Breeding etc. in America, Great Britain, Germany, Denmark, Holland, Belgium. Methods of teaching and organization.

Distribution of Breeding Cockerels in Italie. La prima Distribuzione di galli miglioratori agli agricoltori della Provincia di Roma. Federico Clementi. R. Scuola Agraria Media di Roma. 6 Luglio 1930.

Breeding stations have been established in Italy where birds of high producing capacity are bred. These stations distribute good breeding-cockerels among poultry farmers. On the 1st July, 1930, 3500 cockerels were delivered.

Antique Poultry Keeping. Pollicoltura Antica. Federico Clementi. R. Scuola Agraria Media di Roma. 1926.

A lecture given at the conclusion of a course in poultry keeping. Old breeds and statements by classic writers were discussed.

Modern Poultry Keeping. Pollicoltura moderna. Federico Clementi. R. Scuola Agraria Media di Roma. 1926.

Description of the beginning of poultry keeping in various countries of North and South America and Europe in which the writer appears to be very well posted as regards the conditions in many countries. Further a description of poultry keeping and the measures to be taken for the promotion thereof in Italy.

Review of some Breeding Experiments carried out at the U.P. Poultry Association Farm, Lucknow. A. F. Fawkes. The Indian Poultry Gazette, 1931, p. 28.

The primary need for an egg producing breed of fowl that will be more immune to the Indian climate and conditions than imported poultry has led to conduct experiments to endeavour to discover such a breed.

Experiments were made by crossing Chittagong hens with Rhode Island Red males, but the results were no good. Neither did experiments with Leghorn males. The dominant zero factor of the Indian hen nullifys the attainment of better flock production in the progeny.

The following year author experimented in crossing pure Bussorah or Busrafowls with White Leghorn males. The chickens showed immunity to the hot season conditions.

The author gives the results of first cross experiments carried out in 3 successive winters. Egg production and size of egg was remarkable. Broodiness was practically eliminated by the introduction of the non broody White Leghorn strain.

Seven of the Busra pullets were sent to the Laying Test. Milford, England.

The Relation of Antecedent Egg Production to the Sex Ratio. E. W. Callenbach. State College, Pennsylvania. Poultry Science, VIII, p. 230.

Pearl and Jull found that prenatal mortality had no effect upon the sex ratio as shown by chicks placed in brooding quarters. They also found that the proportion of males decreases as antecedent egg production increases. It is with this phase of sex ratios that this paper is concerned.

On the basis of one year's work with single comb white Leghorns and Plymouth Rocks no relation was found to exist between antecedent egg production and the sex ratio of chicks placed in brooding quarters.

Further Studies on Factors influencing the Weight of Eggs. Horace Atwood and Thomas Clark. Agric. Exp. Station, West-Virginia. Poultry Science, VIII, p. 193.

The egg weight increases with the age of the bird, fluctuates with the season of the year and is affected by the position in the cycle. A poorly balanced ration reduced the egg weight 12 % and milk products increase the weight size of eggs.

This paper showes the relationship between production and egg weight when a physiological disturbance is caused by a drug. Kamala caused a decrease in production with an attendant decrease in egg weight.

Developing a complete Poultry Breeding Program. Paul B. Zumbro. State University, Columbus, Ohio, Poultry Science, VIII, p. 45.

Author describes the four branches of the Ohio Poultry Improvement Association which are as follows: General Activities, Accredited Hatcheries, Certified Flocks, Record of Performance Flocks.

Turkey Breeding in South-Afrika. Kalkoene as 'n winstgewende Bijboerderij. E. F. Lombard. Departement van Landbou-Union of South-Afrika, Pamflet no. 86.

Contents:

Origin of Turkeys. Breeds. Mammouth Turkeys. White and Black Turkeys. Housing, Breeding. Culling. Mating. The Start. Handling. Nutrition. Incubation. Fattening. Marketing. Sanitation. Standards.

Further data on a case of autosomal linkage in the domestic fowl. L. C. Dunn and W. Landauer. Jour. Genetics, pp. 95—101.

Data are presented which indicate linkage between the characters dominant white, polydactyly, and hernia in poultry.

Experiments with Poultry. O. A. Barton. North Dakota Agric. Exp. Station. Bull. 233, 1930.

Comparison of initial weight and rate of growth of sexes. The average hatching weights of 21 male and 29 female turkeys were 1.87 and 1.91 oz., respectively, and at 6 months of age the average weights were 15 lbs. 12.75 oz. and 9 lbs. 13.21 oz., respectively.

Fertilisation in the domestic Fowl. D. C. Warren and Lester Kilpatrick. Kansas Agric. Exp. Station. Poultry Science, VIII, p. 237.

Summary:

1. If a male in a mating is replaced by another, the offspring of the replacing male very soon supplant those of the former and there is practically no over-lapping of the offspring of the two males.

2. The flagellum of the sperm is lost during the first day's existence in the oviduct of the female. This may account for the advantage which fresh sperm have other those which have been in the oviduct a longer period.

3. In the case of timed matings, the later introduced sperm lose their advantage after they also have been in the oviduct for more than a day.

4. The viability of embryos is not influenced by the period of retention in the oviduct of the sperm which fertilize the eggs from which they hatch.

5. The period between the removal of the male and onset of infertility is not influenced by the rate of production of the female.

6. The staleness of sperm does not influence the sex ratios.

7. The position of the egg in the cycle does not have any effect upon the sex ratios.

Individuality as affecting Points of Egg Quality. C. S. Platt. Poultry Science, VIII, p. 189.

Summary:

Seventeen White Leghorn pullets were fed a ration similar to that used on commercial poultry farms.

All of the eggs produced were marked with the number of the bird and date laid.

Approximately one week after being produced these eggs were examined for weight, shell texture and firmness of white.

The individual bird had a marked effect upon all three points observed, the weight of the egg being influenced to a greater extent by the individuality of the bird than the other two factors.

Observations concerning the Time Factor in Egg Production. Horace Atwood. Agric. Exp. Station, West Virginia. Poultry Science, VIII, p. 137.

Conclusions:

The data examined apparently justify the following conclusions:

1. The longer the cycle the shorter are the intervals between the laying of successive eggs.

2. The interval between the laying of the last two eggs of a cycle is usually greater than any other interval in the cycle.

3. The intervals between the laying of eggs at or about the middle of the cycles are shorter than the intervals at either extremity.

4. As the birds become older the intervals between the laying of successive eggs become longer.

5. The shorter average intervals are usually associated with the more prolific layers.

The Book of artificial Incubating. Das Buch der Kunstbrut. C. M. Müller, Poultry Experiment Station, Bevensen (Lüneb. Heide).

In the writer's opinion the best remedy against chicken diseases is a chicken that has been properly hatched. For this reason and on the grounds of years of experience he discusses artificial incubation. The book, which is richly illustrated, treats: Structure of the Egg. Chemical composition of the egg. The Technic of Incubation. The Temperature in various kinds of Incubators. Moisture. Ventilation. Turning the Eggs. Disinfection of Incubators. Faults during Hatching.

Experimental studies concerning the development of the chicken embryo. I. The toxic Action of Lithium and Magnesium Salts. Walter Landauer, Storrs Agricultural Experiment Station, Storrs, Conn. Poultry Science, VIII, p. 301.

Summary:

Experiments in which Ringer's fluid alone, and various concentrations of the chlorides, sulfates, and bromides of lithium and magnesium dissolved in Ringer's fluid were injected into the air space of developing chicken eggs on the 6th day of incubation, lead to the following conclusions:

The fluids are absorbed immediately into the eggs.

The injection of 2 ccm of Ringer's fluid results in an increased mortality following the injection with a corresponding decrease in the death rate at the end of the incubation period. The experimental conditions apparently cause a selective mortality of weak embryos which under normal incubation conditions succumb to the physiologial adjustments taking place just before hatching.

The injection of a 1/20 m solution of lithium chloride in Ringer's fluid does not appreciably affect the embryonic death rate before the 19th day of incubation. After this time, however, a much greater mortality takes place than under normal conditions. This shows that a salt solution injected into the eggs early in incubation may not affect the development of the embryos until a short time before hatching. It can be concluded from these results that the late mortality under normal incubation conditions at least partially may trace back to disturbances early in development.

Lithium is more poisonous for the chicken embryo than is magnesium.

Experiments with different concentrations of lithium and magnesium chloride demonstrate that the poisonous action of these salts increases as a direct function of the concentration. This does not hold true for lithium and magnesium sulfate which show a practically identical toxicity of the 1/10 and 1/40 m solutions and a less toxic action of the 1/20 solution. Lithium bromide causes a very similar mortality in 1/20, 1/40, and 1/80 m solutions, and the same is true for 1/10, 1/20, and 1/40 m solutions of magnesium bromide.

No malformation occur under the influence of lithium and magnesium salts injected into the developing eggs on the 6th day of incubation.

DISEASES

PULLORUM.

Combatting Pullorum. Eleventh International Veterinary Congress, London, August 4th to 9th, 1930.

At the closing meeting, the following resolution was passed:

Fowl Typhoid and Bacillary White Diarrhea:

In the opinion of this Congress, the method of diagnosis and prophylaxis of B. W. D. by systematic agglutination tests, carried out by qualified veterinarians, is at the present moment the procedure most to be recommmended.

The Reaction of the Fowl to Pullorin. L. D. Bushnell and C. A. Brandly. Kansas Agric. Exp. Station, Contribution no. 134. Journal of the American Veterinary Medical Ass., 1931, p. 64.

Conclusions:

1. The very thin skin of the wattle of the fowl precludes the possibility of intradermal injection in many cases, with the methods generally employed.
2. The reaction to a single intradermal injection of digest pullorin is manifested by a non specific early swelling in infected as well as non infected fowl; which reaches its maximum size at three to four hours following injection, and a later specific reaction which attains its maximum size at an average time of 22.5 hours.
3. The character, of soft edema with more or less severe swelling as detected by the touch, is a more satisfactory criterion for interpretation of the reaction to pullorin than the increase in the thickness of the wattle as measured with the micrometer.
4. Macroscopically and microscopically, the pullorin reaction resembles the tuberculin reaction as manifested in birds and other species.
5. Frequent repeated tests with digest pullorins do not cause significant desensitization of reactive individuals.
6. The ecto and digest pullorins used in these studies were more satisfactory than other types prepared in our laboratory or those obtained from other sources.
7. In an effort to develop a satisfactory pullorin sources of variation in the test, including methods of application and standards of interpretation and comparison, must be given major consideration.

The Drummond pipetting Machine. M. F. Barnes. Bureau of Animal Industry, Harrisburg, Pennsylvania. Journal of the American Veterinary Medical Association, 1931, p. 241.

Auther has experimented with various types of automatic machines, elec-

trically driven. It has been difficult to find a satisfactory machine. The machine, designed by L. E. Drummond of Edw. P. Dolbey & Cy., Philadelphia, is given a thorough test and is found to come up all requirements.

A Comparison of the intradermal and agglutination Tests for Pullorum Disease, based on demonstrating the Infection in the Hatch from Reactors. B. H. Edgington and A. Broerman. Agricultural Experiment Station, Reynoldsburg, Ohio. Journal of the American Veterinary Medical Association, 1931, p. 219.

Discussion and Conclusions:

In this experiment it was determined that hens in the group reacting to the agglutination test but not to the intradermal test transmitted S. pullorum infection in each of ten hatches. If the flock had been divided on the basis of the intradermal test only these hens would have remained in the negative group and would have been a source of disserminating pullorum disease. The hens reacting to the intradermal test but not to the agglutination test, failed to transmit the infection to chicks during the hatching period.

These observations indicate that the intradermal test under the conditions of this experiment was not so satisfactory as the agglutination test indetecting carriers of pullorum disease in mature fowls.

An Apparatus for delivering a measured Amount of Antigen in Routine Testing for carriers of Bacillary White Diarrhea. F. R. Beaudette. Agric. Exp. Station, New Jersey. Poultry Science, VIII, p. 266.

Description of this apparatus with two illustrations.

Bacillary white diarrhoea. G. Mayall. Vet. Jour. 1930, p. 185.

During the course of post-mortem examinations made in the spring of 1930, at which time pullorum disease was prevalent among chicks in England, a mortality rate of 95 per cent being common, nodules were found in all but 1 of 36 cases. In 2 cases there were nodules on the lungs, heart, and gizzard, in 16 cases on the lungs and heart, in 1 case on the gizzard only, in 2 cases on the heart only, and in 14 cases in the lungs only. The chicks came from 23 counties in England.

Comparison of modified Antigens for the Avoidance of cloudy Reactions in agglutination Tests on Fowl Blood Serum. W. L. Bleecker and S. J. Schilling. University of Arkansas, Fayetteville. Poultry Science, VIII, p. 277.

Conclusions:

Comparisons were made of the frequency of occurrence of the non-specific precipitation known as the cloudy reaction in the agglutination test for carriers of **S. pullorum** when an unmodified antigen was used simultaneously with antigens containing 0.04 % NaOH, 0.1 %, 5 % NaCl, and 1.8 % NaCl.

The cloudy reaction was encountered on all antigens used.

The 0.04 NaOH antigen reduced the total cloudy reactions but appeared to be of greatest value in altering the type of non-specific precipitates and caused

a diffuse clouding to appear in place of flocculent clouding, which latter is probably the more serious type of interference. Thus, the incorporation of NaOH into antigen appeared as a definite improvement.

In our test the addition of formalin to antigen appeared of some value but did not give as satisfactory results in suppressing the cloudy reaction as were obtained with the other modified antigens used.

Further tests on antigens containing graded qualities of NaCl are indicated to be desirable as is a continued study of the entire problem.

Death cases in Hens caused by Fränkel-Bacilli. Ein Beitrag zur *pathologischen Anatomie von „Gasödemerkrankungen" unserer Haustiere.* Dr. G. Pallaske. Veterinär-Pathologisches Institut der Universität Leipzig. Tierärztliche Rundschau, 1930, p. 647.

In two hens the writer found severe oedema after deep wounding. The Fränkel-Bacil was found here in pure culture. A pigeon died within 12 hours after infection.

High Mortality after Blood-drawing for Agglutination. A warning by Dr. te Hennepe.

I draw attention to the maligne oedema infection as, in February last, I investigated a case in which at a poultry farm, 70 of the best breeding birds died as a result of infection with bacilli of this group, 2 days after the drawing of the blood in the wrong place. The muscles of the wing had been deeply pierced and the bleeding had been stopped by means of cotton wool pushed into the wounds. A day after the operation the wing swelled up to the thickness of two hands and the hens died the following day. A post-mortem showed that the subcutaneous oedema extended from the neck to the leg at the side on which the hen had been operated.

New Agglutination-Test with fresh Blood. Beitrag zur Methodik der Frischblutschnell-agglutination auf Pulloruminfektion unter Verwendung eines neuen Agglutinationstisches. Jan Steenblock, Bakteriologisches Institut der Landwirtschaftskammer für die Rheinprovinz, Bonn. Direktor: Dr. H. Eichmann. Tierärztliche Rundschau, 1930, p. 881.

In 96 % of the cases the results of the new agglutination method with fresh blood agreed with those of the slow method with serum. This method can be applied by every veterinary surgeon. The writer has designed and marketed a glass-plate with mirror by which the reading of the test has been simplified.

Prophylaxis against Pullorum. Un Essai de Prophylaxie de la Diarrhée bacillaire des Poussins dans un élevage infecté. Staub et Truche. Bulletin de l'Académie vétérinaire de France, 1929, p. 183.

Authors use for the agglutination test live cultures in broth of Martin. This is diluted 3 or 4 times with physiologic salt solution. In a tube containing 1 ccm of this antigen 1 drop of serum of the hen is dropped.

Comparative tests with pullorin and agglutination test gave good results.

Authors suggest the following combatting-system: 1. Two or three times a year testing by pullorin; 2. During breeding time agglutination-test.

TUBERCULOSIS.

The Incidence of Avian Tuberculosis in Mammals other than Swine. L. van Es and H. M. Martin, Agric. Exp. Station, Lincoln, Nebraska, Research Bulletin 49.

Conclusions:

1. The avian strain of bacillus tuberculosis was determined to be a cause of tuberculous disease in cattle.
2. Avian tuberculosis infection of bovine animals was found only in solitary lymphnode lesions in nearly 10 per cent of the cases furnishing lesions of this type.
3. All bovine lesions originating in cases of generalized tuberculosis were shown when typed to contain the bovine bacillary strain only, and no incidence of avian infection was encountered in this class of material.
4. Some evidence obtained indicates that infection due to the avian bacillary, strain may be a factor of confusion in the interpretation of tuberculin test results.
5. In the material supplied by 227 cases of human tuberculosis no evidence was encountered which would tend to implicate the bacillus of avian tuberculosis as a cause of tuberculous disease in man.
6. While a certain potentiality for mischief may be atributed to the avian bacillary strain, it is not apparent that avian tuberculosis has at this time assumed importance as a menace to the public health.
7. On the other hand; the prevalence of avian tuberculosis on farms must be looked upon as a positive hazard to other livestock.

Note on tubercle bacilli of avian origin harbored in the udder of a cow. C. A. Mitchell and R. C. Duthie. Canad. Jour. Research, 1930, pp. 406-408.

This is a contribution from the Animal Diseases Research Institute, Dominion Department of Agriculture. The tubercle bacillus, isolated from an avian sourrce, the common crow, in the studies previously noted, remained alive in the udder tissue of a cow 210 days after intravenous inoculation without producing demonstrable macroscopic lesion. Reinoculated from the udder tissues into laboratory animals, it proved virulent and caused progressive lesions in chickens and rabbits but not in guinea pigs.

Combatting Tuberculosis. Ein Beitrag zur Bekämpfung der Geflügeltuberkulose. Dr. A. Berger, Beeskow (Mark). Tierärztliche Rundschau, 1931, p. 42.

The writer made tests with „Fowl-anti-phymatol Klimmer". Several veterinary surgeons report favourably on this. In infected pens the condition of the hens improved, mortality ceased and the laying capacity increased. The writer considers anti-phymatol a valuable help in combatting tuberculosis.

Pseudo-Tuberculosis of Birds (Ducklings). Contribution à l'étude de la pseudo-tuberculose des oiseaux. C. Truche et J. Bauche. Bulletin de l'Académie Vétérinaire de France, 1930, p. 391.

In a previous publication the writers described pseudo-tuberculosis in turkeys and this disease in canaries and ducklings is now treated.

The bacil of Malassez and Vignal was found in the liver of canaries. Guinea pigs which received injections of the vaccine died after 5 days.

The cultures from the spleen of ducks began to grow only after 3 days. Of 40 ducks 18 died at the age of 1 month. Young turkeys and rabbits also died of this disease at the same farm Geese and hens remained healthy.

The bacil was also found in a monkey which had been brought from a bird fancier in Marseilles and in three Arabs who died in Algeria.

DIPHTHERIA.

The Effect of Fowl- and Pigeon-Pox Virus Vaccination on Egg Production. W. T. Johnson, Agric. Exp. Station, Corvallis, Oregon. Journal of the Am. Vet. Med. Ass., 1931, p. 98.

Table I shows that fowl-pox virus may be used without highly disastrous results to egg-production. Production for 14 days after vaccination was 63 % and for 15 to 28 days, 41 per cent.

Investigations have demonstrated pigeon virus effective for fowl-pox control. A flock of 400 fowls was vaccinated, 50 in lay, with pigeon virus and the remainder, including 100 in lay, with fowl virus. The fowl virus caused a decided drop in production and the pigeon virus permitted a high rate. The possibility that the pigeon virus was responsible for a decrease in production can not be eliminated.

Diphtheria and Pox. L'epitelioma contagiosa o vaiolo aviario. Suoi rapporti etiologici con la difterite aviaria. Osservazioni sullo studio sperimentale in animali recettivi. Immunita. G. Ramazzotti. La Clinica veterinaria, 1929, p. 267.

The vaccine of pox and that of diphtheria are the same. No success attended experiments to cause pox in pigeons by means of fowlpox-vaccine. The internal organs, the brains and the blood contain the vaccine and are capable of causing the disease.

Artificial immunity may last four months. The virus loses its virulency by repeated passage.

Influence of Vaccination on Egg Production. Die Beeinflussung der Legetätigkeit von Junghennen durch die „Antidiphtherin-Schutz-umfung". Dr. V. Völker, Universitäts-Tierpoliklinik, Leipzig. Deutsche Tierärztliche Wochenschrift, 1930, p. 813.

Tests with hens vaccinated against diphtheria. The 30 hens which had been vaccinated laid over a period of four months, an average of 43.2 eggs per hen. The hens which had not been vaccinated averaged 39.9. The laying capacity of the vaccinated hens did not, therefore, decrease.

PARASITES.

Coccidiosis in Gallinaceous Birds. Ernest Edward Tyzzer, American Journal of Hygiene, 1929, 2. Ref. Journal of the Am. Vet. Med. Ass., 1931, p. 114.

In the chicken four distinct species of coccidia and their pathogenic properties are described.

1. Eimeria tenella (Railliet et Lucet, 1891) designates the species producing severe hemorrhages in the ceca and sometimes in the large intestine and lower small intestine. On the 5th day after infection large quantities of bright red blood are passed by the virus. Oöcysts appear in the feces 7 days after ingestion of infective forms. Most of the deaths occur from 5 to 7days after infection.
2. Eimeria mitis (new species) designates a form which is distributed in a diffuse manner chiefly in the upper portion of the small intestine. Invaded epithelial cells desquamate and regeneration takes place promptly because only individual cells are involved instead of large areas of tissues, as in the E. tenella infection. The E. mitis appears to be relatively harmless, since it does not seem to affect the condition of the bird and no gross lesions are found at autopsy.
3. Eimeria acervulina (new species) is found chiefly in the upper half of the small intestine, sometimes in the lower portion, rarely in the ceca.
   Invasion by E. acervulina occurs in foci, the maturing oöcysts accumulating at these points.
4. Eimeria maxima (new species), involving the middle portion of the small intestine. The birds show anorexia, paleness, roughened feathers. The droppings show an excessive chalk-like material and the exudate is tinged with blood. This form and E-acervulina are present in the so called „chronic cocidiosis".
   The coccidia of pheasants, turkeys and quail were studied and several new species are described.
   Coccidiosis is a self-limiting disease. Coccidial infections die out promptly when the ingestian of sporulated oöcysts is prevented, a strict immunity results from infection in some cases, while in others an incomplete but effective protective reaction is produced. The most pronounced immunity is developed by infections with the species E. tenella and E. maxima. A resistance to one species in no case was found to protect against any other species.
   Rations high in milk content or milk sugar were not found efficacious in preventing infection. It is pointed out that the greatest development of coccidia takes place in those portions of the chicken's intestine which have the most acid reaction, i.e., duodenum and ceca.

Pathological conditions ascribed to nematodes in poultry. Eloise B. Cram,, Bureau of Animal Industry. Circular 126 C.

Intended for zoologists, poultry specialists, and veterinarians who deal with parasitic diseases of poultry. The conditions ascribed to nematodes are classified according to clinical symptoms and pathological changes of affected birds.

Trichomonas Diversa N. Sp. and its Association with a Disease of Turkeys. Fritz Volkmar, Columbus, Ohio. Journal of Parasitology, 1930, p. 85.

Summary:

1. Trichomonas diversa a new flagellate of the genus Trichomonas, family Trichomonadidae, order Protomonadida, is here described.
2. This Trichomonas has been observed exclusively in the lumen of the upper digestive tract of turkeys.

3. It has invariably been found associated with peculiar lesions of the mucous membrane of the upper digestive tract of these turkeys.

The Present Status of our Knowledge of Poultry Parasitism. Eloise B. Cram. Bureau of Animal Husbandry, Washington, D.C. Poultry Science, VIII, p. 35.

The chicken is the carrier of the blackhead organism; this organism may be spread directly, or at the other hand, it may be passed within the egg of the cecum worm, Heterakis gallinae, which protects it from adverse external conditions.

Two trematodes have been reported. Collyriclum foba occurs in the skin of chickens and turkeys, Prosthogonimus injures or destroys the ovaries and oviducts. Twelve species of tapeworms are found, author gives description of the worms and the intermediate hosts.

Also numerous species of roundworms are described.

Fowl Spirillosis in the Libanon. Etude d'une épizootie de spirillose avaire au Liban. Chaillot. Bulletin de l'Académie Vétérinaire de France, 1930, p. 379.

Description of cases of spirillosis in the environs of Beyrouth. The infection is transmitted by the tick Argas Persicus.

Experiments with Cestodes Raillietina Fuhrmann. Vergleichende Untersuchungen an Hühnercestoden der Gattung Raillietina Fuhrmann 1920. Rudolf Lang, Wien. Zeitschrift für Parasitenkunde, Tome I, p. 562. With 27 Illustrations. (Ref. Wiener Tierärztliche Monatschrift, 1931, p. 24.)

When Raillietina Echinobothrida (Megnin 188) appears it is of importance to be able to make a diagnosis quickly as the parasite can cause considerable damage to poultry flocks. For this reason the differences in Raillietina Grobbeni Böhm (1925), Raill. tetragona (Molin) and Raill. cesticillus (Molin) are described in detail.

A new Parasite in the Blood of Water-Fowl. Giganto-bilharzia monocotylea. Lothar Szidat, Zeitschrift für Parasitenkunde, 1929-'30, p. 583.

The writer discovered blood-trematodes in the intentinal venes of seagulls (Larus ridibundus) and a drake of a wild duck (Anas Boschas).

This kind, Giganto bilharzia, is described and illustrated by the writer.

Artificial Inoculation with Proteosoma. Die Künstliche Proteosomainfection der Vögel. Ein Beitrag zur Frage der Immunität und Immunisierung bei Vogelmalaria. Dr. Harald Lotze, Hygiene Institut der Universität Greifswald. Zentralblatt für Bakteriologie, 1930, Bd. 119, p. 165.

1. The writer could not show any infection with Proteosoma praecox in canaries.
2. There was no natural resistance to artificial infection.

3. There is no form of absolute cure of malaria in birds. What is looked upon as immunity is a latent chronic form of malaria.
4. Birds in which no parasites have been discovered during a long period cannot be re-infected.
5. No proof can be given of transmission of the disease through the medium of the egg.

Cestodes in healthy Fowl. Trakulje pri navidezno zdravih Kokosih. Ceh. Josip. Thesis 1930 (Ref. Deutsche Tierärztliche Wochenschrift, 1930, p. 831).

The writer examined 500 hens which had been slaughtered in hotels and found tape-worms in 97 of them (19.4 %). The 10 species of tape-worms are named and described.

Moreover in 202 cases (40.4 %) Heteracis vesicularis was found and in 68 cases (13.6 %) Heteracis perspicillum.

Treatment of Ascariosis in Chickens. Behandlung der Spulwurmkrankheit bei Hühner-Kücken. J. Mócsy. Allat. Lapok, 1930, p. 55 (Ref. Deutsche Tierärztliche Wochenschrift, 1930, p. 831).

In the case of 169 young hens it was determined that the discharge from the caeca could be clearly distinguished from that from the rest of the intestines. The technic of the examination of the faeces is described. The presence of a few worm eggs in birds is of serious importance. The eggs of worms in the blind gut only occur in the discharge from this gut.

Various remedies have been examined in connection with their action as regards the removal of worms. Aralban (which contains 18 % chloride and 1 % iodine) appeared to be the only active remedy.

The Description of a new Fluke found in the Indian House-Crow Corvus Splenders). V. R. Phadke, Bombay Veterinary College and Amarnath Gulathi. Imperial Institute of Agricultural Research, Pusa, Bulletin no. 203. The Indian Veterinary Journal, Jan., 1931, p. 231.

Description of a fluke, recovered on post-mortem examination in a house-crow during an epedimic, attended with high mortality amongst the crows. The species of this fluke appeared to be one hitherto undescribed. The incidence of occurrence of worm parasites was not found as high as one would expect from such scavenger birds. Only six out of forty-five crows examined harboured this fluke. An interesting record was also afforded by the ocurrence of a tapeworm species and a microfilaria from this host.

Contents: Description of the Fluke, Discussion of the systematic position of the Fluke-Genus Multivitellaria, lives in the gall badder of crows. The species is dedicated to Mr. K. Hewlett, Principal Bombay Veterinary College and is named after him: M. hemletti.

OTHER INFECTIOUS DISEASES

„Keel Disease" in Ducklings in Britain. S. H. Gaiger and G. O. Daires. Department of Veterinary Pathology, University of Liverpool The Journal of Comparative Pathology and Therapeutics, 1930, p. 125.

Summary and Conclusions:

An outbreak of „Keel Disease" in ducklings is described in Britain. It appears to be the first recorded outbreak in this country. A bacillus belonging to the Salmonella group was aparently the causal organism. This bacillus was found to be culturally pathogenically, and serologically identical with, or very closely related to Salmonella anatum Rettger and Scoville non, aertrycke type. The organism was not always present in pure culture, but other organisms when present revealed no evidence of pathogenicity. The supply of investigation material was cut short by the subsidence of the outbreak in responce to the methods of prevention described, and any further outbreaks which may be brought to our notice will be utilised to investigate further the etiological significance of the Salmonella type of organism isolated. Our present view is that the pathogenic powers of the S. anatum are of a low order that possibly the organism may be found to be a normal inhabitant of the intestines of ducklings, and further, that the capacity to become pathogenic depends upon the operation of some predisposing factor, as in this case feeding with fermented foods.

Having acquired pathogenic properties the bacterium rapidly causes an enzootic which is kept in being by the presence of ducklings of the susceptible age. In this outbreak the absence of susceptible ducklings for a period of a few weeks was sufficient, after the removal of the predisposing factor to stop the outbreak.

No conclusion was reached regarding the deaths in pigeons upon Farm B. The pigeons had not received any of the ducklings' food and only one dead pigeon was received for examination.

Infectious Laryngotracheitis of Fowls. G. Kernohan. Division of Veterinary Science, University of California, Berkeley, California. Journal of the American Veterinary Medical Association, 1931, p. 196.

Conclusions:

Laryngotracheitis is an acute infectious disease of fowls.

Pathological changes occur principally in the larynx, trachea and bronchi. These changes consist of inflammation of the affected parts and a excessive amount of mucus and hemorrhage into the lumen of these organs. The contagium localizes in these respiratory organs and in the contained exudate.

Death apparently results from asphixation rather than a generalized infection.

The nature of the causative agent has not been determined although rather exhaustive trials were made to culture or filter the virus.

Infection has been produced only by instillation of the contagium into the respiratory tract.

Injections of the tracheal exudate did not increase the resistance of fowls against subsequent infection.

Paradysentery in young Chicks. C. A. McGaughey. Department of Bacteriology and Preventive Medicine, University of Manchester. The Journal of Comparative Pathology and Therapeutics, 1930, p. 308.

This paper records a disease in young chicks resembling pullorum-disease. The organism appears to be one of the group described as Dysenteroid or Paradysentery bacteria. This organism approximates most closely to Type 14a of Morgan and Ledingham (1909) isolated from the faeces of children suffering from

summer diarrhoea. It seems probable that the infection was transmitted through the egg. This suggests that adult carriers occur; the organism was recovered from the yolk residue in a bird 2½ months old.

Leucosis and Fowl Paralysis. Impressions in Europe and America while on study Leave 1929—1930. Dr. Gillet de Kock, Onderstepoort. Journal of the South-African Veterinary Medical Association, 1930, p. 92.

January and February 1930 were spent in the Pathological Institute of the Veterinary Faculty in Leipzig, Leucosis in fowls formed the bulk of the post-mortems at that Institute. No cases of neurolymphomatosis have come to their notice and this would indicate that there is after all no association between these two diseases.

Neuritis or Paralysis of Fowls. L. P. Doyle. Agric. Exp. Station, Purdue University. Poultry Science, VIII, p. 159.

The importance of this disease is now quite generally recognized. The pathology has already been adequately described. The disease produces very definite gross and microscopic changes in the nervous system. The striking gross and microscopic pathology and the persistence with which it propagates itself in flocks of fowls indicate that it is a distinct infectious disease.

This paper presents an evidence indicating that the disease is frequently transmitted from parent to offspring through the egg. It is dessiminated in much the same way as bacillary white diarrhea..

Experiments with Leucaemia. Untersuchungen über die Leukämie der Hühner. Dr. Lüttschwager. Tierseucheninstitut der Landwirtschaftskammer Hannover. Archiv für Tierheilkunde, 1931, p. 552.

Leucaemia is increasing considerably and in this institute 103 cases were discovered in 1930, this being 16 % of the total number of hens submitted. This disease is now becoming a serious threat to poultry breeding. It occurs remarkable frequent in conjunction with other diseases, especially tuberculosis. The changes caused by this disease are often very much like those caused by tuberculosis.

Initial symptons of tuberculosis and leucaemia are often very similar. The fact that these two diseases often go together is worthy of close attention.

Leucaemia in Poultry. Beiträge zur Kenntnis der Hühnerleukose. Prof. Dr. Karl Jármai. Pathologisch-anatomisches Institut der Tierärztliche Hochschule in Budapest. Archiv für Tierheilkunde, 1930, p. 113 (with two illustrations).

During recent years leucaemia has been steadily increasing in Hungaria. In some cases it was possible to transfer the disease to other hens.

The diseased hens do not eject virus. Blood-sucking parasites (Argasideae) appear to be capable of transmitting the disease. 70 % to 100 % of the attempts to transmit the disease by means of the virus examined were successful. The disease lasted from 11 to 60 days. Most of the hens died within one month. The disease was of the intravascular lymphatic leucaemia type, the anaemic type being seldom found. In the diseased organs at 2° C. the vaccine remains virulent for 10 days and in Ringer's liquid even 13 days.

The virus works independently of cells and passes the Sigmondy-Bachmann filter.

Leucaemia in Fowl. Beitrag zur Leukämiediagnose beim Huhn. Dr. Silvia von Bornstedt and Dr. H. Röhrer. Institut für Tierhygiene der Preuszischen landwirtschaftlichen Versuchs- und Forschungsanstalten, Landsberg a/d Warthe. Berliner Tierärztliche Wochenschrift, 1931, p. 81.

The number of cases of leucaemia discovered at the institute at Landsberg have increased recently. Transmission of the disease by means of material from hens which have died is very difficult. The examination of the blood is of little value for the distinguishing of the disease. For this reason the writers amputated pieces of the liver of live hens according to the method of Oppermann and Lauterbach. The operation was successful in practically every case, post-hemorrhage from the liver seldom occurred. The attempts to transmit the disease to a cock with these pieces of liver were successful.

Detailed tables of the composition of the blood of the diseased birds were given.

Anthrax in Pigeons. Die Virulenzsteigerung der Milzbrandkeime im Körper avitaminöser Tauben. Nai, Dino. Biochimica e Terapia Sperimentale, Milano, 1929, p. 217. (Ref. Wiener Tierärztliche Monatsschrift, 1931, p. 20.

By passage through pigeons suffering from avitaminosis, the writer succeeded in making anthrax bacilli more virulent. A tribe before passage killed 14 % of the pigeons vaccinated and after passage 100 % of the pigeons died.

Immunisation against Diseases by Feeding with killed Germs. Perorale *Immunisierungen mit abgetöteten Krankheitserregern bei jungen und erwachsenen Säugetieren und Vögeln.* Dr. H. Dempe. Zeitschrift für Hygiene und Infektionskrankheiten, 1931, p. 80.

In cases of mass vaccination against a sudden epidemic of a contagious disease the administration of the vaccine through the medium of the food is far and away easier than the vaccination of each bird separately.

In hens the agglutination-titer rose from 1 : 200 to 1 : 12800 and the titer could also be increased in chickens. In chickens of 3-½ months however, high titers were found even without the immunisation. In general the degree of immunity was not sufficiently increased by this method.

Psittacosis and Chick Disease. Similarity between Psittacosis and an Epizootic observed among Chickens at Kodaikanal. D. A. Turkhud, Koidaikanal. The Indian Veterinary Journal, 1931, p. 237.

A slightly fatal epizootic of Chickens at Kodaikanal was at first thought to be one of cholera. This was disproved by examination. The epidemie was similar, in all repects, to „Ranikhet Disease", identical with Doyle's „Newcastle Disease". Psittacosis is also caused by a filter passing organism. From the symtoms, pathological appearances and bacteriological features, there is every reason to suppose that all these diseases are identical.

Artificial Infection with Proteosoma in Birds. Die künstliche Proteosoma infektion der Vögel. Ein Beitrag zur Frage der Immunisierung bei Vogelmalaria. II. Mitteilung. Dr. Harald Lotze, Hygiene-Institut der Universität Greifswald. Zentralblatt für Bakteriologie, originale, 1931, p. 107.

Conclusions:

In malaria no immunity can be obtained with passive immunisation. A slight immunity is obtained with active immunisation. Favourable results are obtained by weakening the plasmodis which then only cause a slight infection. From investigations it would appear probable that Proteosoma praecox are able to form Toxines.

Malaria in birds can be caused by feeding.

Tuberculosis, Pullorum, Pox and Coccidiosis. Tuberkulose, Ruhr, Pocken und Kokzidiose des Geflügels. Dr. Lerche, Breslau. Tierärztliche Rundschau, 1931, p. 161.

Extensive literary review and references to the above mentioned diseases.

Brucella Bang in Birds. Des Possibilités de Transmission de la Fièvre ondulante par les Oiseaux. M. H. Violle. Bulletin de l'Académie de Médicine. 1931, p. 216..

In the French Academy of Medicine, Dr. Violle, together with Dr. Montus, recentlty published a report over his infection tests with Brucella in birds. They have arrived at the supposition that birds could transmit the infection, owing to the fact, which they had experienced, that cases of Brucella Bang (febris undulatus) sometimes occur in places where there is no other source of infection to be found and where the disease was formerly unknown. Three pigeons received an intramuscular injection of Brucella; one died within three days and the other two were kllled on the seventh day after the injection. From the blood, heart, spleen and liver the Brucella could be regenerated in a pig. Two finches also received Brucella injections. One died 48 hours afterwards and the blood contained a pure culture of Brucella. The other remained healthy and was killed a week later; all the organs still contained Brucella Bang bacilli.

Similar results were also obtained with singing thrushes. That birds are, therefore, receptive to the infection and can function as Brucella carriers is of such great importance because they are not subject to quarantine regulations and sanitary barriers. Especially pigeons, which live in close contact with farms that are often seriously infected with Brucella (the urine from sheep, goats and cattle suffering from Brucelliasis) are quite easily capable of transmitting the infection over considerable distances.

This is undoubtedly an important new point of view.

COCCIDIOSIS.

A Note on Coccidiosis in Sparrows and Poultry. Donald C. Boughton. University of Minnesota. Poultry Science, VIII, p. 184.

The writer has examined the intestinal contents of one hundred English sparrows from the neighborhood of Minneapolis. Writer reports briefly upon the findings of previous writers and gives an account of his own observations. The parasitic coccidia belong to one or the other of the two genera, Eimeria and

Isospora; which differ from each other as clearly as a dog and cat. Author's examination of 95 sparrows revealed no cases of infection with Eimeria, but showed 66 % infection with Isospora.

Conclusions: Eimeria has never been authentically reported from small birds. Wild birds in the United States are commonly infected with coccidia belonging to the genus Isospora.

GENERAL.

Poultry Diseases. Including Diseases of other domesticated Birds. With a chapter on the Anatomy of the Fowl. B. F. Kaupp. 5th Edition, Revised and Enlarged, London, Baillière, Tindall and Cox, 8 Henrietta Street, Covent Garden, 1929. 436 pages, 166 Illustrations, price 16 d.

Contents:

List of Illustrations, Anatomy of the Fowl, Physiology of the Fowl, Blood and Circulation, Sanitation, External Parasites, Internal Parasites, Diseases Due to Protozoa, Diseases of the Digestive Tract, Diseases Due to Bacteria, Constitutional Diseases, Diseases of the Respiratory Passage, Diseases of the Liver, Diseases of the Ovary and Oviduct, General Diseases, Tumors, Diseases of the Nervous System, Bacteria of the Intestinal Tact, Animal Parasites and Bacteria of Eggs, Malformations, Fractures-Wounds-Anesthesia, Castration, Food Poisonous to Fowls, Poultry Remedies, Disease Chart, Glossary of Terms.

Some Lesions associated with Paralysis. A. M. Lee, College of Veterinary Medicine, Columbus, Ohio. Journal of the American Veterinary Medical Association, 1931, p. 203.

Conclusions:

The lesions were studied in forty seven cases of paralysis, forty fowls from twenty-eight flocks, five dogs and two sheep. The outstanding lesion, and the only consistent one in all the cases, was catarrhal enterites with extensive desquamation of the epithelium of the villi of the intestines.

A leucocytic infiltration principally with lymphocytes and endothelial cells was found in thirty-two birds, twenty five showing it in the sciatic nerves fifteen in the cerebrum, fourteen in the medulla, eleven in the pons, nine in the optic lobe, six in the cerebellum, and six in the iris and the ciliary body. There were numerous other miscellaneous tissues showing infiltrations.

Of five dogs studied, four showed lymphocytic and endothelial infiltrations in the cerebro-spinal system, and one in the liver.

Sciatic nerves of dogs and sheep contained no cellular infiltrations. Thirteen fowls had distinct enlargements of the sciatic nerves.

Four had a whitish opaque appearance to the eye. There were no enlargements of the nerves, or changes in the eyes in the dogs and sheep, which might be explained by acuteness of cases, species susceptibility or specific affinity of toxic products.

Marchi's method and frozen sections stained with Sudan III showed slight fatly degeneration of some of the enlarged nerves.

The enlarged nerves were collected in a number of birds with paralysis from which microscopical studies were not made. These birds were not included in the total number.

These enlarged nerves varied in their water content from 73 to 81 per

cent in comparison with 60 to 67 per cent in non paralized birds which would indicate edema.

Twenty four of the forty fowls had coccidia. Of the remaining birds six were not examined for coccidia other than by stained sections; in five the feces were not centrifuged; and in four others scrapings from the intestines were not examined.

Six fowls had tapeworms and seven were not examined for microscopic tapeworms.

It appears that fowl paralysis is not a specific disease, but is the result of cronic catarrhal enteritis with very extensive desquamation of the epithelium of the villi of the intestines and subsequent absorption of toxic products from the digestive tract.

There are a number of things that cause catarrhal enteritis.

In fowls one common cause is coccidiosis. Other causes are intestinal parasites, especially tapeworms, and dietary disorders.

The more important Poultry Diseases. L. van Es and H. M. Martin. College of Agriculture, University of Nebraska, Lincoln. Bulletin 195, 1930.

Contents:

Introduction. Poultry Hygiene and Sanitation: The control of transmissible diseases; Sanitation. Microbic Diseases: Fowl cholera; Fowl typhoid; Bacillary white diarrhea; Tuberculosis; Roup, Fowl Pox and cancer; Coccidiosis; Blackhead; Favus.

Parasitic Diseases and Parasites: Ectoparasites; Lice; Flies, gnats, mosquitoes, bedbugs, and fleas; The mites (Acarina); Red mite; The harvest mite or chigger; The mite causing scaly-leg; The depluming mite; The air-sac mite; The flesh-mite.

Endoparasites: The fluke-worms; The tapeworms; Hymenolepis carioca; Choanotenia infundibuliformis; Davainea tetragona and Davainea cesticullus; Davainea echinobothrida. The roundworms: Ascaridia perspicillum; Heterakis vesicularis; Heterakis dispar; Acuaria hamulosa; Syngamus trachea; Worms and disease. Deficiency Diseases.

The Poultry Industry: A new Field for the general Practitioner. Norman Hole, Veterinary Laboratory, Ministry of Agriculture, Weybridge. The Veterinary Journal, Febr. 1931, p. 74.

In the course of recent years the poultry industry has been steadily increasing, and it has nearly doubled itself in the short period of nine years. In 1921 there were 24 million fowls in Engeland and Wales whilst in 1930, the number is about 48 millions.

Including ducks, geese and turkeys the figure for 1930 approximates 53 million.

The chief obstacles in the road of succesful poultry farming is undoubtedly disease. In this country 75 % of poultry produce comes from general farms and it is mainly in this direction that future expansion will take place. Between the veterinary surgeon and the poultry farmer there are several barriers which are difficult to surmount. The question of fees is one of the foremost to be considered. It may be said that as a result of the apathy shown by the veterinary surgeon, the poultry farmer no longer regards him as the authority to whom he should take his troubles, and we see, unqualified persons doing work on subjects to which the skill of our profession alone should be applied. The value of the whole-blood test in expert hands, compared with that of the serum antigen test, is a matter of opinion but in the hands of the inexperienced is worthless.

Except in diseases showing characteristic lesions such as Tuberculosis, Fowl-Pox and Blackhead diagnosis is unfortunately a matter for a worker with full laboratory facilities. Surely in this country the time has come for the veterinary profession to cast off its apathy and take up the matter of poultry pathology, in order to assist a great national industry and to enlarge the field of the general practitioner, which, in this mechanical age, is slowly becoming more and more restricted.

Report of work on diseases and parasites of poultry. O. A. Barton. North Dakota Sta. Bull. 233, 1930, pp. 106-108, 110, fgs. 3.

Brief reference is made to tuberculosis eradication work in the college flock, the introduction of pullorum disease and coccidiosis into the flock and control work therewith, the control of lice and mites by the use of sodium fluoride, and the successful use of 1 and 2 per cent of cod-liver oil in preventing leg weakness in young chicks and poults.

In work with blackhead 33 poults were raised on rotated clean alfalfa range not previously used for other poultry without loss. The same year all but 4 of 45 poults placed on a range formerly used for chicken ranges and separated from the other lot only by a 20-ft. farm driveway died during the summer. An infestation of tapeworm is said to have been checked by the use of kamala.

Combatting Poultry Diseases in the Netherlands. Annual Report of the State Serum Institute at Rotterdam. Verslag van de Werkzaamheden der Rijksseruminrichting. Dr. L. F. D. E. Laurens, Rotterdam, 1931.

The poultry department of this Institute (Dr. B. J. C. te Hennepe, head of Poultry Division) during 1929 made post-mortal examinations on:

1985 adult hens and 1204 chicks, 99 ducks, 2 geese, 41 pigeons, 21 turkeys, 15 feasants, 6 peacocks, 4 swans, 6 parrots, 21 canarybirds, 15 other birds. The tabel on pag. 23 gives details of the differernt diseases found in these birds.

During this year 153871 bloodsamples were agglutinated for the pullorum test. Only 5379 samples or 3½ % reacted positive.

In the Netherlands is erected a „Pullorum Combatting Association", in which poultry breeders, veterinary surgeons and State Serum Institute are cooperating. By the working of this association the number of blood samples tested increased rapidly as will be seen from following figures: In 1925 were tested 1918 samples, in 1926 1029, in 1927 5439, in 1928 76436 and in 1929 153891. The percentages reactors decreased from 6.2 %, 4.6 %, 6.7 %, 5 % to 3.5 %.

All reacting birds are delivered to a central point and killed under supervision of the association. On 113 farms with 48.219 birds the tests were made during two consecutive years.

In the first years there were 2330 reactors or 5 %, in the second year there were only 1.6% reactors.

From these farms there were 31 which had the first year 3 % reactors and were found free of pullorum by the second test.

From 4850 hens the blood was also tested for agglutinins with Brucella Bang. From these 17 birds occurred to be reactors.

The Serum Institute is delivering a vaccin against fowldiphtheria, prepared on pigeons. This vaccin is delivered to veterinary surgeons at a price of 20 cents (8 dollar-cents) pro c.c.m.

Progress Report on Poultry Disease Investigation at the Michigan Experiment Station. H. J. Stafseth and W. L. Mallmann. State College, Michigan. Poultry Science, VIII, p. 19.

Description of: The Agglutination Test for Bacillary White Diarrhea, Differential Media, Selective Media, Leg Weakness and Paralysis.

Extension Program for Poultry Sanitation and Disease Prevention in Alabama. George A. Trollope. Polytechnic Institute, Auburn. Poultry Science, VIII, p. 273.

Description of the triple-yard plan for farmers-poultry-keepers. An organized effort is being made to reduce the mortality caused by bacillary white diarrhea.

The results of the first years test were 8.6 % reactors, of the second yeartest were 5.2 %. A „Grow Healthy Chicks" project was inaugurated.

Rickets in Chicks. III. The Effectiveness of Mid-summer Sunshine and Irradiation from a Quarz Mercury Vapor in preventing Rickets in Chicks. G. F. Heuser and L. C. Norris. Agricultural Experiment Station, Cornell University, Ithaca, N. Y. Poultry Science, VIII, p. 89.

Conclusions:

1. An average daily exposure to direct midsummer sunshine at 42.5° N. latitude for 10.9 minutes was sufficient to prevent the development of rickets in chicks and to produce normal growth up to 8 weeks of age. Whether or not an exposure of shorter duration would give equally good results remains yet to be determined.

2. Irradiation from a new Cooper-Hewitt quartz mercury vapor arc, A.C., at a distance of 36 inches and with an equivalent D.C. operating voltage across the arc of 62 volts for a daily average of 9.1 minutes was sufficient to produce normal growth in chicks up to 8 weeks of age but some indications of the development of rickets was obtained. Complete protection was obtained by irradiating for an average of 13.7 minutes daily.

3. The effectiveness upon chicks of irradiation from a quartz mercury vapor arc, A.C., at 36 inches and with an equivalent D.C. voltage of 62 volts was not found to be materially greater, if any, than exposure to strong mid-summer sunshine.

4. The measures used in these experiments gave no positive indication of any difference in the effects from exposure to direct sunshine and irradiation from a quartz mercury vapor arc. However, the results of repeated observations indicated that the chicks in the sunshine group possessed greater vigor and smoother plumage than the chicks in the mercury are group.

Geese killed by Bees. Tijdschrift voor Diergeneeskunde, 1931, 1st January.

In Wurtemberg a flock of geese which had distrubed the rest of a swarm of bees were attacked. The birds were literally covered with bees which were driven off with water. It was to late, however, and the nine full-grown geese died from the results.

Veterinary Surgeon and Poultry Industry. Dr. G. Schmid, Veterinär-pathologisches Institut der Universität Zürich. Schweizer Archiv für Tierheilkunde, Jan. 1931, p. 7.

The Swiss Poultry Association has requested the Government to allow the free import of anti-diphtheria vaccine. The Government has refused this request so that this vaccine is only delivered to veterinary surgeons. The vaccine is delivered by Dr. Gräub's Bacteriological Laboratory at Bern.

Mercury Poisening in Canaries. Quecksilbervergiftung bei Kanarien. Dr. Sustmann, Dresden. Berliner Tierärztliche Wochenschrift, 1931, p. 86.

Mercury preparations are often harmful for cattle, cats and birds. The writer describes a case in which 13 canaries died a few hours after their heads had been rubbed with a 10 % mercury salve. It concerned a case of mildew disease of the skin which is caused by mildew in the food and begins with the falling out of the feathers at the corners of the beak and on the head. The mildew also causes inflammation of the intestines and kidneys.

Amputation of a wing from a swan. Die Amputation des Flügels beim Schwan. Dr. R. Frölich, Ratibor. Tierärztliche Rundschau, 1931, p. 78.

The writer has performed operations on many swans in order to prevent them flying away. The amputation was performed at the carpal-joint and is accurately describied. The hemorrhage is minute and easily stopped. The swans are kept in cages for a week after the operation. The bandage is then removed and they can swim free.

NUTRITION

Feeding Trials with laying Hens. J. Holmes Martin and W. M. Insko. Agric. Exp. Station, Lexington, Ky., Bulletin no. 294.

Part. I. Varying Percentages of Meat Scrap in the Mash for supplementing Milk.

Summary:

1. When Barred Plymouth Rock pullets were fed a shelled-corn-skim-milk ration, supplemented with a mash containing meat scrap, the average production for three years was as follows: 2½ % meat scrap—170 eggs; 5 %—162.4 eggs; 7½ %—174 eggs; and 10 %—162.7 eggs. The winter averages were: 2½ % meat scrap—47.3 eggs; 5 %—48.4 eggs; and 10 %—44.4 eggs.

2. When White Leghorn pullets were fed a shelled-corn-skim-milk ration, supplemented with a mash containing meat scrap, the production for one year was as follows: 2½ % meat scrap—149.2 eggs; 5 %—167.0 eggs; 7½ %—173.4 eggs; and 10 %—151.1 eggs. The winter averages were: 2½ % meat scrap—48.2 eggs; 5 %—47.6 eggs; 7½ %—49.9 eggs; and 10 %—46.2 eggs.

3. When the amount of grain fed was kept fairly constant and the mash was kept before the birds at all times, there was no significant difference in the mash consumption of the various pens. There was also no significant difference in the amount of milk consumed by the various pens.

4. The average feed consumption over a three-year period, including milk solids, was as follows: 2½ % meat scrap pen—83.3 pounds; 5 %—82.9 pounds; 7½ %—84.3 pounds; and 10 %—85.6 pounds.

5. When Barred Plymouth Rocks pullets were fed a shelled-corn-granulated buttermilk ration the average winter production for three years was 38.2 eggs; the yearly production was 146.1 eggs, while the production for the pen receiving 10 % meat scrap mash in addition to the above ration was 41.4 eggs for the winter and 157.2 eggs for the year.

Part II. A comparison of a dull-gray ground Limestone and a shiny white Limestone as Sources of Shell forming Material.

Summary:

1. The white, shiny limestone proved more attractive to the birds than the dull-gray limestone.

2. Both the white, shiny limestone and the dull-gray limestone proved to be adequate sources of calcium for egg shell formation.

3. Birds may be induced to consume an adequate supply of the dull-gray ground limestone if it is kept constantly before them in open hoppers.

Part. III. All-Mash versus Grain and Mash for laying Hens.

Summary:

1. Barred Plymouth Rock pullets on an all-mash ration averaged 54.6 eggs

for the winter and 167.4 eggs for the year. The pen receiving grain and mash averaged 54.7 eggs for the winter and 174.3 eggs for the year.

2. White Leghon pullets on an all-mash ration averaged 59.4 eggs for the winter and 182.7 eggs for the year. The pen receiving grain and mash averaged 55.4 eggs for the winter and 182 eggs for the year.

3. Barred Plymouth Rocks pullets on an all-mash ration consumed 85 pounds of mash per hen during the year, whereas those on the grain-and-mash ration consumed 84.2 pounds of grain and mash per hen.

4. White Leghorn pullets on an all-mash ration consumed 77.7 pounds of mash per hen during the year, whereas those on the grain-and-mash ration consumed 81.7 pounds of grain and mash per hen.

5. The mortality was low in all pens.

6. There was no significant difference in the mortality, health, fertility and hatchability between the different pens.

7. There was a distinct relation between maintenance of body weight and egg production. When body weight dropped, a drop in egg production soon followed in nearly every case.

8. Sudden drops in temperature in most cases were followed by declines in production.

9. The return over feed cost from the grain-and-mash pen of the Barred Rocks exceeded that from the all-mash pen by 17 cents per hen; whereas that of the Leghorn all-mash pen exceeded that of the grain-and-mash pen by 15 cents per hen.

10. Proper sanitation was more difficult in the all-mash pens because of moist droppings and wet litter.

Green Feed and Pasture for Poultry H. A. Schoth. Agric. Exp. Station. Oregon State Agric. College, Corvallis, Oregon. Station Circular 85.

The object of this publication is to bring briefly to the attention of poultrymen the better methods ofproducing green feed and pasture, the crops best to use, and how to practice economical utilization of such crops.

The poultry business is becoming more specialized and competitive. Green feed for poultry is in many cases not available on the market. Transportation and cost usually require that it be produced near where it is to be fed. Because of its necessity and value to the flocks and because of high land valuation in in many cases, an intensive system of cropping is necessary to produce a maximum of green feed on a minimum of land.

It is very important that a continious supply of green feed be provided. To do this a definite cropping system must be arranged and in some sections root storage facilities provided. Systems of providing this feed are herein presented as suggestions for the various sections where poultry is important. There are many plants well adapted for green feed that will grow under a wide range of conditions. There are but few sections where some kind of fresh feed cannot be grown for at least part of the year and in practically all of them roots can be grown and stored to provide winter succulents.

If maximum results are to be obtained, green feed crops should be grown in a regular rotation. Liberal manuring or fertilization of the land usually assures better and larger yields. Where the crop is grown on land used as yards, the poultry manure may add to the parasite and disease problem and therefore should not be used. Other manure or commercial fertilizers should be used instead. Green feed to be economical must produce heavy yields since production and harvest methods of these succulent crops, on a poultry ranch scale, cannot otherwise complete with mass production of larger farms.

Often the green feed is grown in part on vacant yards that are being cleaned up by cropping them.

Green Feed Crops for Poultry. M. E. McCollam. Western Washington Experiment Station, Puyallap. Bulletin no. 8 W.

Table of Contents:

Kale: Varieties; Feeding of; Amount to plant; Growing the Crop; Insects and Diseases of; Seed Production.

Japanese Lettuce: Varieties; Planting of; Insect damage.

Lawns: Soil preparation for; Grasses for; Seed for; Seeding of; Care of.

Alfafa: Varieties of; Soil preparation for; Seeding of; Cultivation of; Harvesting of.

Chicken runs and yards: Temporary crops for; Grass seedings for.

Feeding Poultry for Egg Production. C. W. Knox. Agric. Exp. Station, Ames, Iowa. Circular no. 114.

Summary:

1. To secure maximum production, strict attention must be paid not only to proper feeding but to breeding, housing and equipment.
2. Chickens must have the proper kind and amount of feed to produce well.
3. Water or milk is the most important part of the ration.
4. A lack of sufficient water may cause the birds to molt.
5. The best and most economical protein supplement to add to the ration is liquid skimmilk or buttermilk.
6. It is very poor economy not to feed an animal protein supplement (milk products, tankage or meat scraps).
7. Corn is by far the best and most economical energy yielding feed but is usually fed in too great a quantity.
8. The vitamin content of a ration is amply supplied when the ration contains yellow corn, milk and cod-liver oil, or when direct sunlight is available.
9. Minerals are sufficiently supplied by ground oyster shells, bone meal and common table salt.
10. Grain and mash feeding is usually best for winter use.
11. Green feed is necessary and can be furnished in the form of cabbages, mangel beets of sprouted oats.

Feeding for Egg Production. F. E. Fox, Agricult. College, Corvallis, Oregon. Bulletin no. 410.

Contents:

The use of feed; What do feeds contain? Variety of Feeds is desirable; Feeds should be readily eaten; Feeds used should be available feeds; An economical ration; Scratch grains, Mash feeds, Green feed, Minerals, Water, Milk, Vitamin feeding, Method of feeding, Mash feeding, Milk feeding, Bringing the pullets into lay.

A balanced and an unbalanced Ration fed prior to the Hatching Season as affecting the Hatchability of Eggs and the Vigor of the Progeny, Horace Atwood, Agric. Exp. Station, West Virginia University, Morgantown. Bulletin no. 207.

Conclusion:

This experiment affords no evidence tending to show that a reasonably

heavy egg production immediately prior to the hatching season has a detrimental influence on the fertility or hatchability of the eggs or on the vigor of the progeny.

Feeding Chickens. M. A. Jull and A. R. Lee. Farmers' Bulletin no. 1541, Bureau of Animal Industry. Washington D.C.

Efficient feeding practices are necessary to make poultry raising most profitable and to produce the best quality of products.

The feed is the most important cost factor in raising poultry. Therefore the selection of feeds and the method of feeding are very important matters.

In feeding all classes of poultry a proper balance of the various nutrients is necessary, especially proteins, carbohydrates, minerals, and vitamins.

In this bulletin the relative value of the different nutrients is discussed and methods of feeding chickens for different purposes are outlined.

This bulletin supersedes Farmers' Bulletin 1067, Feeding Hens for Egg Production.

Contents:

Nutrition and metabolism. Composition of feeds important. Requirements of satisfactory rations; Protein requirements; Vitamin requirements; Mineral requirements; Fat and carbohydrate requirements. Basic principles of feeding. Feeding chicks. Feeding market poultry: Feeding broilers. Feeding market poultry—Continued: Fattening roasters; Fattening old hens and cocks. Feeding laying hens: Important factors in egg production; Feed requirements; Recommended rations for laying stock; Feeding practices. Feeding breeding stock.

Growth of Chickens in relation to feed consumption. Morley A. Jull and Harry W. Titus. Poultry Husbandman. Journal of Agricultural Research, Vol. 36, p. 541.

The rate at which an animal producing flesh for human consumption gains in weight, as expressed by the number of units of feed required for the successive unit increases in live weight, is a problem of considerable practical importance. In the raising of poultry for market it is well recognized that beyond a certain stage in growth the value of the feed required to produce 1 pound gain in weight of live animal is out of all proportion to the value of the gain. Hence there has developed the common practice of marketing growing poultry at from 8 weeks to about 8 months of age. So far as the authors are aware, however, no experimental work has ever been undertaken to determine precisely the relationship between growth and feed consumption in the domestic fowl.

In poultry husbandry there are several types of phenomena which involve a gradual decrease in the per unit effect of some causal factor as the quantity of the factor acting increases. One phenomenon illustrating this point is the annual decrease in the egg production of hens, which after three or four years is so great that few hens produce eggs enough to justify the feed consumed. At the United States Animal Husbandry Experiment Farm, Beltsville, Md., it was found that for a period of three years, with a small group of birds, the annual average egg production per bird was 236, 188, and 167 for the first, second, and third years, respectively. Egg production decreased each year, and assuming that laying hens consume approximately the same amounts of feed each succeeding year, it is obvious that egg production would soon become unprofitable. Brody, Henderson and Kempster, in a rather large group of birds of two breeds, observed that each year's production was 88 per cent of that of the preceding year.

Another illustration of gradual decrease in the per unit effect of some causal factor as the quantity of the factor acting increases, may be cited in the results obtained at the United States Animal Husbandry Experiment Farm in

feeding laying hens different quantities of protein. In rations in which the protein, except that contained in the grains, was provided exclusively from meat scraps, egg production increased as the protein level was raised, but above a protein level of 20 per cent egg production did not increase at the same rate as the protein level was increased. In other words, as the protein level was increased above the 20 per cent level there was relatively a decreasing rate of egg production.

In the growing of chickens the same principle applies; there comes a time when the rate of growth decreases although feed consumption may be on the increase. Available data indicate that the relationship between increase in live weight in growing chickens and increase of feed consumed is expressed by the law of diminishing increment. Though comparatively few data are available to test the application of the law in the case of growing chickens, a rather complete discussion of it in its application to cattle, hogs and chickens is given by Spillman. A very interesting feature of the law is that it provides for the calculation of the rate of gain per feed unit, and the number of feed units per pond of gain, in growing chickens and in chickens that are being fattened for market. The purpose of the present experiment was to provide data, obtained under controlled conditions, to test the application of the law of diminishing increment as applied to growing chickens.

The Growth of Rhode Island Reds and the Effect of feeding Skim Milk on the Constants of their Growth Curves. Harry W. Titus and Morley A. Jull. Journal of Agricultural Research, Vol. 36, p. 515.

Summary:

Growth data were obtained on two groups of Rhode Island Red chicks which received the same treatment and the same feed, with the one exception that one group had access to both sour skim milk and water while the other group received only water. Each group was composed of one lot each of cockerels, capons, and pullets.

A study of the variability of the growth data suggested to the writers that the variability of live weight, as indicated by the standard deviation, may be of some value in determining the approximate time of the beginning and end of growth cycles.

A period of high variability in live weight was observed in the case of each of the six lots. For the lots receiving skim milk this period was between 0 and 7 or 8 weeks of age and for the lots not receiving skim milk it was between 0 and at least 12 weeks of age.

The curve of a monomolecular, autocatalyzed, chemical reaction was fitted to the growth made by each lot during the first 15 to 18 weeks and the curve of diminishing increment was fitted to the later stages of the growth of each lot.

Most of the constants of each curve were markedly affected by the feeding of sour skim milk.

Feeding sour skim milk had no marked effect on the calculated mature weights.

The data indicate that milk feeding accelerated growth during the first 15 to 18 weeks; according to the smoothed average-rate-of-growth curves, this acceleration took place between the time of the first feeding and 11.5 to 14.5 weeks of age.

The data further show that the rate of growth of the chicks receiving no skim milk was somewhat greater during the later stages of growth than that of the chicks receiving it.

The constant R (or e—k) for the curve of diminishing increment was not

affected by feeding milk; its value was rather constant for each of the six lots.

The calculated average-rate-of-growth curves for the first 15 to 18 weeks were found to be narrower and higher for the lots receiving skim milk than for the lots not receiving it.

In the case of the lots of chicks receiving skim milk the point of inflection of the growth curve occurred earlier than in the case of the lots not receiving it. This suggested to the writers that the more nearly a „perfect" condition of nutrition is approached the more nearly will the whole of the growth curve approach the curve of diminishing increment.

The mature weights of Rhode Island Red cockerels, capons, and pullets were found to be, according to the values of the constant A for the curve of diminishing increment, 4.459, 4,049, and 3,351 gm., respectively.

By means of the equation of the curve of diminishing increment it was estimated that the ages at which maturity is reached are 21 to 23 months for cockerels and pullets and 17.4 months for capons.

Growth and the Relation between Live Weight and Feed Consumption in the Case of White Pekin Ducklings. Harry W. Titus, Bureau of Animal Industry, Poultry Science, Vol. VII, p. 254.

Summary and Conclusion:

Curves were fitted to the feed-growth data and the age-growth of a group of White Pekin ducklings.

It was found that the relation between live weight and feed consumption was expressable by the law of diminishing increment, and that the relation between live weight and age was described rather well by Robertson's modification of the equation which describes the course of an autocatalytic monomolecular chemical reaction.

The Gross Maintenance Requirement of White Leghorns. Harry W. Titus, Bureau of Animal Industry. Poultry Science, Vol. VIII, p. 80.

A method of determining the gross maintenance requirement of chickens by means of special feeding experiments is described. The gross maintenance requirement of White Leghorn hens, 16 months old and weighing, on an average, 1,632 grams, was estimated as being 64 grams (of the special feed mixture used) per bird, per day during July. The amount of this special feed mixture required, over and above the maintenance requirement, to produce an egg was estimated as being about 40 grams.

Washington Chick Rations. M. Wayne Miller, W. D. Buchanan, J. S. Carver. Western Washington Experiment Station, Puyallup. Bulletin no. 15 W.

Table of contents:

Important Steps in Management. Essentials of a Good Chick Ration. Vitamins Necessary. Mineral Feeds for Growing Chicks. Proteins for Growth. Recent Experiments with Protein. Quality of Proteins. How to Balance Your Chick Ration. The W. S. C. Chick Ration. Feeding Schedule for 100 Pullets. Feeding in the Laying House.

Oyster Shell and Cockle Shell for Poultry. J. A. Voelcker, Journal of the Ministry of Agriculture, London, 1931, p. 1002.

Conclusion:

It is clear from these trials that, when birds have become accustomed to the use of cockle shell, they will take it just as well and freely as they will oyster shell, and that, as the relative analyses would indicate, there is no practical difference between the two as a source of lime, either as regards the health of the birds or the nature of the eggs. Hence, the preference generally accorded to oyster shell must be put down merely to „fancy", and to advocacy of the more costly material. The conclusion to be drawn, therefore, is that the cheaper material—cockle shell—will answer the purpose quite as well as oyster shell.

What are Tankage, Meat Scraps and Meat Meal? H. R. Kraybill, Purdue University Agric. Experiment Station. Poultry Science, VIII, p. 11.

Description of: A. Sources of Material. There are at least four distinct types of plants which should be considered as follows: 1. The abbattoir or slaughter house; 2. The dead animal rendering plant; 3. The city fat melter; 4. The restaurant and hotel waste rendering plant.

B. Processes: 1. The wet Process; 2. The superior quality of grease obtained by this process and the fact that the odors from the plant are less objectionable than in the wet rendering process, this process is increasing in use.

C. Miscellaneous Tankages and Cracklings.

D. Dry Mixers. Instances of adulteration of tankages and meat scraps with „alba blood". A gelatine product from wornout printer's rolls, cocoa shells, „hynite" (processed leather) and hoof and horn meal have occurred.

E. Definitions. The definitions make a distinction between two types of products, namely the tankages and meat scraps. Meat scraps must consist only of the dry rendered residues to which no stick or blood have been added.

If any of the tankages or meat scraps contain more than 22 per cent $Ca_3(PO_4)_2$ the word Bone must also be included in the brand name as indicated in the definitions.

Nutritive Value of Products. Two tankages sold under the same name and of practically the same proximate composition may have different feeding values.

In studying the relative nutritive value of these animal by-product feeds it is important to give careful consideration to the products from which they are derived.

Experiments with poultry at the North Dakota Station. O. A. Barton. North Dakota Sta. Bull. 233, 1930, pp. 108-110.

The results of several experiments, some of which have been continued, are briefly noted.

Yeast in ration of laying pullets. In 1927-28 the check lot outweighed the yeast lot after the first two months, but the yeast lot came into production slightly earlier and the average egg production for the year was three eggs more per bird than in the check lot. The check lot consumed slightly more grain and less mash than the yeast lot. The eggs in the check lot cost about 0.5 ct. less per dozen than those in the yeast lot. Fertility and hatchability were higher in the check than in the yeast lot.

Poultry feeding experiment. Ohio Sta., Co. Expt. Farms Rpts. 1928, Clermont Co. Farm.

Pullets on a grain and mash ration produced 57 eggs from November 1 to

March 1 and 184 eggs for 11 months, while the egg production of pullets on an all-mash ration was 56 and 177 eggs during similar periods. The birds on grain and mash consumed 81 lbs. of feed, and those on all-mash 75 lbs. Yearling hens on grain and mash produced 18 eggs from November 1 to March 1 and 115 eggs during 11 months, while similar hens on an all-mash ration produced 19 and 133 eggs, respectively. The grain and mash birds consumed 61 lbs. of feed and the all-mash birds 58 lbs.

The utilization of the calcium of calcium carbonate and citrate by laying and non-laying pullets. W. C. Russell and F. G. Mc Donald. Jour. Biol. Chem. 1929, pp. 463-474.

Calcium and phosphorus determinations were made during a 5-week period on 2 lots of 4 White Leghorn pullets each at the New Jersey Experiment Stations. Both lots received the same basal ration, but in lot 1 enough calcium carbonate and in lot 2 enough calcium citrate was added to bring the calcium content of the ration to 1.4 per cent. The phosphorus content of the rations was 0.34 per cent. Analyses were made of the excreta, the eggshells, and the egg contents.

It was evident from the negative or very slightly positive balances and from the lowered excretion of calcium in the droppings during egg production that the birds utilized the calcium from calcium citrate as well as from the calcium carbonate for egg formation. The positive balances that occurred during non-production indicated a retention of calcium for body needs. There was no difference in the breaking strength, grades, egg weights, and percentages of calcium in the shell of the two lots.

During egg production there was usually more phosphorus excreted than during nonproduction. This amount was more than that necessary to form tricalcium phosphate with the excretory calcium. These observations indicated a metabolic change involving phosphorus compounds during egg formation. During nonproduction the percentage of phosphorus in the excreta was less than that required to form tricalcium phosphate. The ratio of calcium to phosphorus in the droppings was lower during egg production than during the non-laying period.

Oats for layers. D. C. Kennard. Ohio Sta. Bimo. Bull. 146, 1930, pp. 152-154.

Continuing this study, a lot of birds receiving a basal ration of ground corn, wheat, meat scrap, poultry bone, salt, cod-liver oil, oyster shells, and chopped alfalfa hay laid 45 eggs per bird from November 1 to March 1 and 76 eggs to June 1. A similar lot, in which 20 per cent of finely ground oats replaced a like amount of corn, laid 49 and 94 eggs, respectively. The feed consumption per bird for the 30 weeks was 33.5 lbs. in lot 1 and 36.3 lbs. in lot 2. The birds receiving the oats weighed about 3 per cent more than those on the basal ration.

Some effects of pimiento pepper on poultry. W. L. Brown. Georgia Sta. Bull. 160, 1930, pp. 11, pl. 1.

In this test 2 lots of White Leghorn hens and cocks were fed a basal ration of grain and mash, but in 1 lot 10 parts of the laying mash were supplemented with 1 part of ground dried ripe pimiento peppers. After 8 days of experimental feeding the eggs were saved for hatching. Chicks hatched from the 2 lots were divided into 4 lots, each lot containing chicks from the plain- and pimiento-fed hens. One of the lots received the basal ration only, while ground pimientos were fed in the ratio of 35 : 1, 22 : 1, and 10 : 1 in the

other lots. At the end of 39 days the shank color and weight of each chick were determined.

In the group of hens fed the basal ration only, 348 eggs were set, of which 41 were infertile, and the hatching percentage of fertile eggs was 77.32. In the group fed pimientos 78 eggs were set, of which 7 were infertile, and 87.52 per cent of the fertile eggs hatched. All of the chicks from the pimiento group were strong at birth and 100 per cent were raised through 6 weeks, while in the other group there were several weak chicks and 94.23 per cent were raised through 6 weeks.

Pigment appeared in the shanks of the chicks from the pimiento eggs after from 5 to 6 days. At hatching time there was no visible difference in the color of the shanks of the chicks, and it is believed that as the unabsorbed yolk remaining in the chick is absorbed the color it contains is deposited in the shanks. At the end of the test chicks from pimiento eggs averaged more pigment in the shanks than those from the plain eggs, and with one exception cockerels averaged more pigment than pullets. As good gains in body weight were obtained with pimiento rations as with plain rations. Rations containing pimientos imparted a rich yellow color to the shanks, skin, and fat, the amount of color depending upon the amount of pimiento fed, but such feeding did not leave any pepper flavor in the meat.

The carotinoids xanthophyll and capsanthin are responsible for the pigmentation imparted by pimiento peppers.

The determination of the anti-rachitic properties of oat oil. L. A. Munro and W. J. Rae. Sci. Agr., 1930, pp. 305-312, fgs. 6.

A basal ration containing 2 per cent of corn oil was fed to 6 lots of 30 White Leghorn chicks each at the Manitoba Agricultural College. Lot 1 received the basal ration only, lot 2 had 1 per cent of the corn oil replaced by cod-liver oil, lot 3 all the corn oil replaced by oat oil, lot 4 the same as lot 3 except that the oat oil was irradiated with a quartz mercury lamp for 15 minutes at a distance of 2 ft., lot 5 the basal ration plus direct sunlight, and lot 6 had the dried skim milk of the basal ration replaced by a like amount of fish meal. The oat oil used had been kept in a sealed container for 1 year. The experiment extended over a period of 14 weeks.

A study of the growth curves, size of bones, X-ray photographs of joints, and ash determinations of the bones and blood showed that the oat oil used had no antirachitic properties either before or after irradiation. The fish meal decreased the rate of growth as compared with the other lots. Leg weakness became evident after 6 weeks' feeding in lots 1, 3, and 4 and after 8 weeks in lot 6, while no weakness appeared during the course of the experiment in lots 2 and 5.

The effect of the curing process upon the vitamin A and D content of alfalfa. W. C. Russell. Jour. Biol. Chem., 1929, pp. 289-297.

Continuing this study (E. S. R., 63, p. 365) at the New Jersey Experiment Stations, it was found that alfalfa leaves from plants dried by artificial heat contained approximately seven times as much vitamin A as the leaves of plants cured in the field. The artificially dried samples were green as compared with the brownish-green color of the samples cured in the field. Only a small amount of vitamin D was found in the leaves of the artificially cured plants, whereas when the alfalfa was dried in the sun without exposure to rain or dew there was an increase in the vitamin D content of the leaves. This increase in vitamin D, however, was gained at the expense of the vitamin A content.

Vitamin E Requirements of Poultry. L. E. Card, University of Illinois. Poultry Science, VIII, p. 328.

Summary:

Briefly then, the results of our observations to date indicate that the addition of weat germ oil to a mixed grain ration at the rate of two per cent can not be expected to improve either fertility or hatching power, even though it may later be shown that the chicken does require Vitamin E for normal reproduction. The latter point is under investigation at the present time.

The Effect of feeding rachitic Diets, containing different Ratios of Calcium and inorganic Phosphorus of the Blood Serum of Chicks. O. N. Massengale. Agric. Exp. Station, N. J. Poultry Science, VIII, p. 335.

Summary:

1. When a rachitic diet low in calcium but high in phosphorus is fed to growing chicks, noticeable leg weakness appears at an earlier age, than when a rachitic diet low in phosphorus but higher in calcium, is fed.
2. The blood serum of chicks, on a rachitic diet, in which the calcium content is higher than the phosphorus, is higher in calcium than inorganic phosphorus. On the other hand, the blood serum of chicks, on a rachitic diet higher in phosphorus than calcium. the inorganic phosphorus is higher.
3. When cod-liver oil is added to rachitic diets and fed to chicks suffering from leg weakness, it tends to increase the calcium content of the blood serum, no matter what the ratio of calcium to phosphorus is in the ration feed.
4. When cod-liver oil is added to rachitic diets, in which the phosphorus content is approximately 3 times that of calcium, it tends to lower the inorganic phosphorus of the blood serum of chicks that were fed this diet.
5. Chicks, on a rachitic diet, in which the calcium content is greater than the phosphorus, when cod-liver oil is added to the diet, the inorganic phosphorus of the blood serum of the birds increase.

Effect of certain Green Feeds Substitutes upon Egg Production and Hatchability. H. O. Stuart. Agric. Exp. Station, New Hampshire. Poultry Science, VIII, p. 354.

Summary:

1. The cod-liver oil pen excelled in egg production.
2. The alfalfa leaf meal pen gave the highest hatchability followed closely by the pen receiving alfalfa leaves.
3. Fifteen per cent of alfalfa leaves or alfalfa leaf meal slightly decreased the palatability of the mash. However, alfalfa leaves were somewhat more palatable than alfalfa leaf meal.
4. All substitutes studied were valuable sources of vitamin A for poultry as measured by the health and egg production, since only one bird died from avitaminosis A and the egg production was fairly uniform from all pens.

Cane Molasses for Poultry. A. R. Winter. Ohio State University. Poultry Science, VIII, p. 369.

Conclusions:

Cane molasses may be used to replace cereal grains, pound for pound, up to 10 per cent of rations for growing chickens and laying hens.

Molasses is a mild laxative, causes increased water consumption, and contributes toward the health and well being of poultry.

Use of Proteins from different Sources in feeding Baby Chicks. Dr. G. S. Fraps and D. H. Reid, Texas Exp. Station. Poultry Science, VIII, p. 383.

The three experiments show that part of the dried buttermilk of the standard ration may be replaced by meat scrap, cottonseed meal or by wheat shorts, and meat scrap without injuring the feeding value of the ration. As all substitutes used were much cheaper than dried buttermilk, the mashes can be materially lessened in cost by the use of these substitutes.

The Calcium-Phosphorus Relationship in the Nutrition of the growing Chick. R. M. Bethke, D. C. Kennard, C. H. Kirk and G. Zinzalian. Agric Exp Station, Wooster, Ohio. Poultry Science, VIII, p. 257.

Summary:

The optimum, or near optimum, ratio of calcium to phosphorus for the growing chick lies between 3 : 1 and 4 : 1. The requirements for the antirachitic factor are at a minimum at this relationship.

Within certain limits of concentration, the ratio of calcium to phosphorus, is of greater significance in calcification and growth than the amounts of these elements in the ration.

The addition of vitamin D, or its equivalent, to the ratio or environment of a chick makes possible a greater variation in the Ca:P ratio and concentration without seriously interferning with growth and normal bone formation.

Data is presented which shows that phosphorus may be just as much of a limiting factor in growth and bone formation of the chick as calcium.

Calcium and Phosphorus Metabolism of the growing Chick. G. Davis Buckner and J. Holmes Martin. Agric. Exp. Station, Lexington, Kentucky. Poultry Science, VIII, p. 284.

In conclusion it seems from the results obtained that tricalcium phosphate, alone or with calcium sulfate or calcium carbonate, caused increased growth and leg bone development of the chick, even though it did not materially influence the percentages of ash in the bones of calcium and phosphorous in the ash. The results indicate that calcium carbonate and calcium sulfate serve equally well as sources of calcium for the growing chick and tricalcium phosphate equally well as a source of calcium and in addition supplies required phosphorous. It is also indicated that a yellow corn-wheat middlings-skimmilk ration contains enough phosphorous to supplement that in the absorbed egg yolk for the growth of White Leghorn chicks for the first three weeks.

Simple or complex Chick Rations. F. E. Mussehl, Roxoe Hill and C. W. Ackerson. University of Nebraska. Poultry Science, VIII, p. 198.

Conclusions:

I. The simple mash mixture herein described proved entirely satisfactory as a chick starting mixture when supplemented with green alfalfa. There were no evidences of nutritional deficiencies at the end of the eight week period and the growth rate was considered very satisfactory.

II. Growing chicks readily tolerate a protein plane of 19.5 per cent during the first eight weeks of the growth period, when the ration is complete for essential vitamins and minerals.

The Value of Milk and Meat Proteins in Chick Rations. O. N. Massengale. Agric. Exp. Station. New Jersey. Poultry Science, VIII, p. 151.

Summary:

1. It is not advisable to feed chicks up to 8 weeks of age a ration containing a high percentage of the meat scrap, used in this experiment.

2. When a ration containing the meat scrap used in this experiment is fed to young chicks it is advisable that some form of milk should be included in the ration.

3. When the meat scrap used in this experiment was fed to young birds, it was found when 13 to 17 per cent was included in the mash, and with water to drink, a severe nutritional disturbance was noted; when liquid milk was given to drink this disturbance did not occur.

4. Chicks receiving a mash plus fresh skimmilk to drink made better and more uniform growth than those receiving the same mash plus some other form of milk.

5. Birds when fed a ration, containing approximately 15 and 17.5 per cent of the meatscrap, made no better gains than those on a ration containing approximately 12 per cent.

6. Chicks which received a mash containing approximately 5 per cent meat scrap with skimmilk or liquid semi-solid buttermilk to drink made better growth than those on a mash containing approximately 15 and 17.5 per cent meat scrap with water to drink.

Ergosterin and Vitamin D. Ergosterin und Vitamin D. Prof. Dr. A. Windaus, Göttingen. Forschungen und Fortschritte, 1 June 1930.

The writer, whose name is inseparable from the artificial preparation of vitamin D., gives in this article a review of what has been positively discovered in this field during a period of three years and also of a few points which are still disputed.

It is certain that the photochemical change of ergosterine into vitamin D. (by subjection to mercury quartz lamp rays) does not lead to a balanced condition but continues to the absolute disappearance of the ergosterine. Side by side with the changes in physical and chemical qualities the chief interest, we have in this question, is the physiological side. The antirachitic vitamin is an intermediary product: as a result of a too long subjection to the rays the antirachitic action is completely lost.

Overdosing with the antirachitic vitamin can lead to the appearance of toxic symptoms. Besides loss of weight calcination is also discernable.

The following are the questions in dispute together with Prof. Windaus' Answers.

1. Are there other means of activating ergosterine besides subjection to rays? The statement that Heilbron succeeded in antirachitically activating ergosterine with the aid of catalysators at a temperature of 250°—300° is, according to the writer, not true. The vitamin D. formed as a result of the subjection to the rays losses its activity at such a temperature.

2. Are there, besides ergosterine, other substances which change into vitamin D. under the influence of U.V. rays? This question as well as number

3. Can the esters of ergosterine be activated?
are both answered in the negative.

4. What happens when ergosterine is subjected to rays?
   The writer does not agree with English experimenters. This, chemical, side of the question is not by any means solved yet.
5. What is the absorption spectrum of Vitamin D.?
   According to Prof. W. the most probable assumption is that the U.V. spectrum has its maximum at 270 m. micron.
6. What role does the wave length of U.V. rays play in the activity of activity of ergosterine?
   Opinions differ greatly on this point.
7. Are the antirachitic and the toxic action of ergosterine which has been subjected to rays caused by the same or by two different kinds of substances?
   This question arises now it is possible, by means of treatment with natrium and aethylalcohol and by means of heating to 200°, to withdraw, from the preparation which has been subjected to rays, its antirachitic activity while it still retains its toxic qualities. From this it must be concluded that there are two different substances present therein or that the antirachitic quality of one single substance is lost earlier by special actions. No one has yet succeeded in making a preparation in which the antirachitic factor is present but the toxic factor absent.
8. Can Vitamin D. be kept unchanged in a low temperature and when the supply of acid is checked?
   Up to a short time ago this was assumed to be the case but the writer has had cases in which a very active preparation kept in a vacuum speedily changed. Moreover, some active preparation, dissolved in soya-oil, quickly lost their antirachitic qualities in these circumstances. The writer expects the most from experiments with ray products of ergosterine which he has obtained in crystal form.

Examination of Fishmeal. Nachtrag zu der Abhandlung „Untersuchungen über den Nachweis der Verfälschung von Fischmehl durch Knochenmehl. Dr. Clauszen. Pathologisch-anatomisch Laboratorium des Veterinairwesens in Hamburg. Zeitschrift für Fleisch- und Milchhygiene, 1930, p. 265.

The bone substance varies in the different kinds of fish. In some kinds the substance contains, besides minute canals, typical lacunes, in others there are no lacunes but a system of minute canals is to be seen. Codmeal contains but few pieces of bone with lacunes. These facts do not in any way tend to make difficult the examination of fish meal for adulteration with bone meal of mammals.

Grit for Poultry. A baromfi kaviesszüksèglete. J. Sever and L. Schneider. Allatorvosi Lapok, 1930, p. 339. (Ref. Tierärztliche Rundschau, 1931, p. 116.)

In 10 % of the hens examined by him the writer came to the conclusion that death was due to lack of grit. Lack of grit causes disturbances in the process of digestion, loss of appetite and obstipation. The post-mortem examination reveals unbroken grain kernels in the intestines.

In order to ascertain the normal quantity of grit necessary 1500 hens were examined. Some breeds need 8-10 grams in the gizzard others 18 grams. The goose needs 19-20 grams, the duck 11-14 and the turkey 32.

Toxic Results with Vigantol. Ueber den Einflusz des Vigantols auf den Tierkörper. Vara-Lopez, Tierärztl. Rundschau, 21 Sept. 1930.

Experiments with large doses of Vigantol. Guinea-pigs and mice showed signs of regress in their general condition already after the first doses; appetite and activity decrease, the hide withers, weight decreases, cachectic and excitus after a short time.

After 3 days three guinea-pigs got hide abscesses, 2 others aborted. Pathological and anatomatical divergences in spleen and kidneys; moreover there appeared to be a disturbance of the recticulo-endothelial metabolic system.

Neither Vigantol-tablets, chlorestine and oil, nor olive oil caused these disturbances: Vigantol-oil is especially harmful.

Nutritive Value of Animal Meal. Der Futterwert des Tierkörpermehls. Prof. Dr. M. Popp. Versuchs- und Kontrollstation der Oldenburgische Landwirtschaftskammer. Oldenburgisches Landwirtschaftsblatt, 22 Jan. 1931.

This article describes a publication by Professor Lehmann of Göttingen which treats the nutritive value of animal meal (tankage, meat scraps). It deals specially with a meal prepared according to the Schirm-Grotkasz method by extraction with benzine. The average content of crude protein in this meal is 58 %, fat 5 % and phosphoric calcium 20 %. Digestibility of the protein is 92 %. A low fat content is of importance. Fatty animal meal soon becomes rancid and is not then readily eaten. The content of fat, therefore, should not be higher than 5 %. Moreover the fat easily absorbs unpleasant smelling matters from the dead body so that fatty animal meal often smells disagreably.

The writer refers to the articles by Dr. te Hennepe (see International Review III, 4, p. 64) which also state that animal meal should not be fatty and that the fat which it does contain, should contain as little as possible of free fatty acids.

EXTENSION

Report of Dominion Poultry Husbandman, 1928. F. C. Elford. Dep. of Agriculture, Ottawa, Canada.

Table of contents:

General Conditions. The Division. World's Poultry Science Association. Breeding. Experimental Work: Hatching summary; Moisture in the incubator; Duration and change of fertility; Ultra violet rays in incubation; Influence of quality of shell upon hatching results; Hatchability from large and small eggs; Starvation period for chicks; Vitamin feeds and varied rations; Vitamin feeds and varied rations in rearing; The effect of sunlight upon growth of chicks; The curative effect of sunlight and antirachitic vitamin containing products in cases of severe rickets; Feed costs and gains in rearing pullets to maturity; Capons vs. roasters; Substitutes for fresh greenfeed; Vitamin feeds for egg production; Comparative value of grainless, gritless and greenfeed-lacking rations for egg production; The value of glass substitutes in laying houses; Animal protein vs. vegetable protein plus a mineral mixture for egg production; Meat meal vs. fish meal for egg production; The influence of ultra violet light upon egg production; Egg preservatives; A study of range of egg weights and possible causes. Experimental Work on the Branch Farms. Canadian National Egg Laying Contest: Registration; Reports; Inspection. Poultry Disease Work: Routine laboratory service; Infectious bronchitis of fowl; The agglutination test as a means of controlling chick mortality when due to bacillus pullorum infection; Mortality study. Waterfowl. Farm, Egg and Poultry Accounts. Demonstrations and Exhibits. Co-operation with other Agencies.

Business Records for Poultry Keepers. E. R. Johnson and A. R. Lee. Bureau of Animal Industry, U. S. Dep. of Agriculture, Washington. Farmers Bulletin no. 1614.

It pays a poultry raiser to keep informed about the many details of his business. There are numerous opportunities to improve the efficiency of the poultry enterprise on farms, and carefully kept records provide information that is useful in planning for profitable poultry production.

The wide variation in results obtained on poultry farms indicates that better returns from poultry may be gained by a more thorough knowledge of the business and by using better business methods in the production and marketing of the products.

Application of better business methods to poultry production and marketing problems has enabled many poultrymen to obtain good returns from their flocks when other poultrymen were losing money.

This bulletin aims to assist poultry keepers in their efforts to apply business methods to their production and marketing problems. Several kinds of poultry records that are useful for farmers to keep are shown and discussed, and steps are suggested for analyzing the records to get the most out of them. Farmers

with small, side-line flocks, as well as those with large flocks, should find suggestions here for improving the efficiency of their poultry business.

This bulletin supersedes Farmer's Bulletin no 1427, Poultry Accounts.

Farm Poultry Raising. M. A. Jull. Bureau of Animal Industry, U.S. Dep. of Agriculture, Washington. Farmers Bulletin no. 1524.

Profits in farm poultry raising are largely affected by the number of eggs produced during the fall and early months of winter and by the number of broilers and roasters that can be marketed when prices are highest. These objects can be accomplished best by hatching early and by having early maturing strains.

Most of the revenue from farm flocks is obtained from eggs. The laying stock should therefore be of the highest possible bred-to-lay quality. It should also be purebred and free from the major standard disqualifications.

The cost of feeding is the most important item of expense in producing eggs and market poultry. For that reason it is very important for farm poultrymen to feed efficiently.

To keep up the flock from year to year great care should be taken in selecting and managing the breeding stock. The best of attention must also be given to the incubation of the eggs and the rearing of the chicks.

Factors of management, such as housing and sanitation, are important in getting best results and should receive very careful consideration.

This bulletin supersedes Farmers' Bulletin 287, Poultry Management.

Poultry Houses and Fixtures. M. A. Jull and A. R. Lee. Bureau Animal Industry, U.S. Dep. of Agriculture, Washington. Farmers Bulletin no. 1554.

Growing chicks and laying hens need comfortable houses that are dry and roomy, with plenty of fresh air and sunlight. It never pays to overcrowd them.

Detailed information on how to build poultry houses is given in the following pages, so that anyone handy with tools can build them.

Persons intending to build are advised to consult the Poultry Department of their State Agricultural College or State Experiment Station.

This bulletin is a revision of and supersedes Farmers' Bulletin no. 1413.

The Michigan grow better Chick Relay Project. Leon Todd. Poultry Science, VIII, p. 374.

This paper is devoted to a project used as part of the extension program in Michigan.

Kentucky's Work with general purpose Fowls. J. E. Humphrey. Poultry Science, VIII, p. 77.

With few exceptions the farms in Kentucky are comparatively small and poultry is kept as a sideline, hence, the general-purpose fowl is the most logical bird for Kentucky farmers.

In the Demonstration Farm Project during the last 5 years 1045 general purpose flocks and 510 light breed flocks were represented.

Comparisons are made between general-purpose breeds and light breeds. With the flocks of the general-purpose breeds 51.3 % of the total income was from the sale of eggs and with the Leghorn flocks 73.2 %.

The general-purpose breeds seem to be more profitable than the Leghorns

as farm flock of not more than 200 hens. The profitable production of eggs require more intensive care than can ordinarily be given to a farm flock. For a larger flock, where much attention can be given to the care, feeding and managment of the fowls, the Leghorns for producing eggs would probably be more profitable.

The Feed purchasing Power of the Eggs produced by a Hen. H. L. Kempster. University of Missouri. Poultry Science, VIII, p. 379.

Using an estimated feed consumption of six pounds of feed per hen per month, it is interesting to note that in the ten-year period there are only 4 months in which a 122-egg hen did not lay enough eggs to more than pay for her feed. This fact should create confidence on the part of poultrymen in the stability of the poultry business.

The Place of fair Judging in the Extension Program. L. M. Hurd. Cornell University. Poultry Science, VIII, p. 344.

In conclusion I think it is safe to say that the object of fair judging under modern conditions is to encourage and stimulate better breeding. It has considerable value, but its place in a general state wide program of extension work, at least under New York State conditions, is bound to be a minor one.

Results of ten Years of Poultry Record keeping Work in Missouri. Berley Winton. University of Missouri. Poultry Science, VIII, p. 103.

In summarizing poultry record keeping work as an extension project it might be said that although it proves to be expensive the cost is waranted from an extension viewpoint because:

1. It furnishes a basis for thorough study of the poultry industry within the state.
2. It indicates whether or not efficient poultry keeping is stable.
3. It provides the Extension Service and the public at large with much valuable subject matter that may be used effectively.
4. It furnishes material that aids greatly in working out county poultry extension programs.
5. It provides a basis for determining the value of various management methods used in poultry keeping.
6. It enhances the prestige of extension workers by virtue of the fact that they have figures on the local poultry situation.
7. The adoption of advocated practices may be secured by showing that efficient poultry keeping pays.
8. The people of the state, other than the cooperators and demonstrators, are kept posted on the financial status of poultry keeping through the monthly reports that are issued.

EGGS, TABLE POULTRY

Construction and packing of an egg case. George H. Powers. Bureau of Agricultural Economics. Leaflet no. 64 L.

Contains instructions for making the form for constructing a standard egg case and also tells how to pack eggs in a standard case.

Turkey Production in North-Dakota. O. J. Weisner, O. A. Barton, Don McMahan. Agric. Extension Division, Agricultural College, Fargo, N. Dak. Circular 82.

Contents:

History and Origin. Selection of Breed and Breeding Stock. Incubation of Turkey Eggs. Feeding young Poults. Management of Mature Stock. Marketing Turkeys. Cost of growing Turkeys. Selection of exhibition Turkeys. Turkey Health. Tuberculosis. Blackhead. Coccidiosis. Cholera. Roup and contagious Catarrh. Tapeworms.

Turkey Raising. Morley A. Jull and Alfred R. Lee. Bureau of Animal Industry, U.S. Dep. of Agriculture, Washington. Farmers Bulletin no. 1409.

Summary:

To be successful in turkey raising, one must give the most careful consideration to certain fundamental factors. The turkeys, especially the growing stock, must be kept under the best possible conditions. Many have made a success in raising turkeys in semiconfinement. An abundance of free range on clean soil is greatly to be desired. Every effort should be made to keep the soil sweet and clean. This is particularly true of the soil on which the birds are fed and where they roost.

Another fundamental essential is to keep healthy and vigorous breeding stock in the best possible breeding condition. The breeders should get plenty of exercise and should not be fed too heavily on fattening rations. It is difficult to get stock that is free from blackhead, but one can at least select breeding stock based on constitutional vigor. By breeding from the most vigorous birds every year, a flock of healthy stock may be developed and maintained. Great care should be exercised in the selection of male breeders each year.

Both old and young turkeys should be protected from dampness. In sections of the country where dampness is prevalent or where rainstorms are frequent, the birds should be provided with suitable protection.

It is very important not to feed the poults too heavily, especially for the first few weeks. Keep them just a little hungry.

Watch the poults carefully for the appearance of lice and take every precaution to keep this pest in check.

So far as possible, remove the cause of any disease that may appear. Clean soil, sanitary quarters, and hygienic methods of feeding will do much to reduce mortality.

Success in turkey raising is largely a question of proper management.

Experiments with Poultry. O. A. Barton. North Dakota Agric. Exp. Station. Bull. 233, 1930.

Dressing shrinkages. Continuing this study (E. S. R., 59, p. 266), in 1928 it was found that the average dressing shrinkage of young turkeys was 9.62 per cent for females and 10.29 per cent for males. The respective drawing shrinkage percentages were 12.21 and 14.77. The total shrinkage from live weight to roaster preparation was 20.53 and 23.54 per cent for females and males, respectively.

Cost of wintering turkeys. The average winter-feed cost from November 25, 1927, to April 25, 1928, of 13 turkeys, most of which were pullets, was slightly over 25 cts. per head per month. The average winter-feed cost from November 18, 1928, to May 18, 1929, of 19 turkeys of mixed ages was 22.65 cts. per head per month.

The feed cost of growing turkeys to 6 months of age. In 1927 it cost 79 cts. per bird and slightly less than 8 cts. per pound of turkey produced to raise 33 pullets to 6 months of age. In 1928 the cost was 93.3 cts. per bird and 7.98 cts. per poung of turkey produced to raised 50 poults. It required 4.1 lbs. of feed to produce 1 lb. of turkey.

The Effect of various Rations on the Storage Quality of Eggs. R. M. Sherwood, Agricultural Experiment Station, Texas. Poultry Science, VIII, p. 99.

Egg from hens, fed with cottonseed meal did not hold up under refrigeration; the color of the yolks ranged from mottled yellow to red and from that to greenish brown or nearly black while the whites varied from normal color to a light pink. The yolks were spongy, some resembled gelatine in consistency.

Since egg-production is a secreting process, it is possible that eggs from hens laying only an occasional egg will not store well while the egg from heavy producers may store satisfactorily.

Experiments are started by feeding hens various amounts of cottonseed meal in capsules.

Abnormal Eggs. E. Roberts and L. E. Card. University of Illinois. Poultry Science, VIII, p. 271.

Description of 2 very large eggs, one weighing 171 grams and the other 164 grams. Each was found to contain within the large shell a normal egg, together with a yolk and white, making two yolks and two whites for each egg. The smaller eggs weighed 62 and 60 grams respectively.

A Marketing Program for the Development of Quality Eggs. W. D. Termohlen. State College, Iowa. Poultry Science, VIII, p. 124.

Description of: Egg grading Discussions and Demonstrations, Publicity, Bulletins and Poster Material, Use of existing Dealers, Community Co-operation, Increased Home Consumption, Co-operation with Poultry Production, Section, Research.

Research Work in Turkey Raising. M. A. Jull. Department of Agriculture, Washington. Poultry Science, VIII, p,. 129.

At the time of the meeting of Poultry Science Association at Lafayette, there was an informal gathering of state poultry leaders interested in state turkey research work. Auther now gives a summary of the amount and kind of research work being undertaken at the various state and provincial experiment stations.

Cost of Growing and Managing Turkeys. O. A. Barton. Agrici. College, North Dakota. Poultry Science, VIII, p. 347.

What is the cost of producing turkeys to the Thanks giving market? How fast will turkeys grow? What does it cost to winter turkeys? How can turkey diseases be controlled? Description of experiments in order to answer these questions.

Contents: Growing Cost. Disease Control. Other Production Expenses. Finishing Feed Cost. Wintering Cost. Does it pay to Dress Turkeys? Shrinkage Losses.

Factors influencing Thickness of Eggshell. Lewis W. Taylor and J. Holmes Martin. Poultry Science,, VIII, p. 39.

Summary:

1. The lack of sufficient amounts of Vitamin D will produce thin or soft-shelled eggs.
2. The presence of an inherited inability to produce heavy-shelled eggs under normal conditions contributes to the number of thin-shelled eggs laid.
3. No significant differences between eggs of different shapes and sizes in thickness of shell were found.
4. Thin-shelled eggs may be produced by pathological conditions in the oviduct.
5. The lack of an adequate calcium supply in chemical combination available to the hen for the manufacture of egg shell will tend to produce thin-shelled eggs.

The Variation in the Weight and Number of Eggs and the Weight of White Leghorn Fowls during the first two Years of Production, Horace Atwood, Agric. Exp. Station, West-Virginia. Poultry Science VIII p. 51.

Summary:

1. This publication covers the records of 178 birds for two laying years and is based on 54.483 egg weight records and 4.272 body weight records. The experiment is being continued.
2. The decrease in the number of eggs laid the second year as compared with the number laid the first year was 20.1 per cent.
3. The decrease in the weight of eggs produced the second year as compared with the weight of eggs produced the first year was 14.4 per cent.
4. The increase in the average weight of the eggs the second year as compared with the average weight of the eggs during the first year was 7.36 per cent.
5. The increase in the weight of the birds during the second as compared with their weight during the first year was 15.3 per cent.

Egg Science. Traité d'Ovoculture. W. Chenevard, expert agricole. *L'oeuf, sa production familiale, fermière et industrielle: son commerce en France et dans le monde.* 1 vol. in-18, de 420 pages, avec 37 figures. Prix: 18 fr., franco, 20 fr. (Librairie J. B. Baillière et Fils, 19, rue Hautefeuille, Paris, VIe).

The author, an old practioner in aviculture, in direct connection with the technicnal services and special organizations of the whole world, has

attempted to compile a summary of all actual information concerning the egg, its composition, production and the trade therein. His work is devoid of all scientific pretention; it is written for the mass of breeders.

Since the war the production of eggs has increased enormously even to the point of becoming one of the principal sources of agricultural wealth in numerous countries and to constituting one of the most important articles of export among the many.

Its production is, above all, democratic; it is the work of millions of breeders praised among all classes of society, and even in countries with important specialized breeds, these do not represent more than the smallest proportion of the national production.

In all his works, Mr. Chenevard, is always party to the principle that a new work is not of interest only as far as its contents are concerned, but also as regards the economies it permits to be realized and the new ideas it presents, allowing a big return. His „Traite d'Ovoculture" is, therefore, above all, practical. He addresses himself both to the small poultry keeper in and around towns and to the big farmers. Those who cannot read the numerous books published in all languages will find, assembled there, the knowledge of all the most recent discoveries of both large and small specialists of present day practice.

The work of Mr. Chenevard is not confined to any one language. It is indispensable because it is practical, documentary and of a clarity which enables every one to find at once that of which he is in need. Reading it attentively one acquires the knowledge of a life long practice. The following is a summary of the subjects treated in this volume: The egg, elaboration, constitution, composition, sex, alimentary value. Preparation for sale, classification, calibrage, mirage etc. Process of preservation according to all known methods. Production. Choice of Breed. Selection of laying hens according to the various modern methods. Practical reproduction. Natural and artificial incubation. Small scale natural and artificial breeding. Conducting laying competitions. Production of eggs specially for hatching, production of ducks eggs and guinea-fowl eggs. Economic conditions of production. Poultry shows.

Poultry Keeping in Germany. Denkschrift zur Hebung der Geflügelhaltung. Preussisches Ministerium für Landwirtschaft, 13 Mai, 1930.

The number of laying hens in Germany on the 1st December, 1929, was 64.713.313. The production in 1927 averaged 80 eggs per hen.

The total value was 517.7 million marks. The value of the meat was 471 million marks. The value of feathers 12.3 million marks. The value of manure 12.5 million. The total value of poultry products amounted to 1063.1 million marks, this being 343 million marks more than value of the wheat crop and 423.9 million marks more than the production of brown-coal.

The largest contributers are the small and medium sized farms. During the last 3 years the value of German production has increased by 300 million marks.

Russia and Holland are the chief countries from which the imports come. It has been estimated that in 1934 Germany will be able to supply the demand for eggs on the home market from local production. The import duties on eggs should be increased.

Salesmanship as applied to the Marketing of agricultural Products. T. A. Benson. Dominion Live Stock Branch, Toronto. Poultry Science, VIII, p. 161.

Courses should be available which would include the following subjects:

The history of co-operative marketing in agriculture, and the real ideals of the movement.

Provincial, state and federal legislation.

Problems in connection with organization and membership,, forms of organization to meet the peculiar needs as affecting the marketing of different commodities; management and operating problems.

Grading and standardization and their significance; warehousing; cold storage; pooling methods.

General business practices; financing; auditing and accounting; credits and collections.

Intelligent distribution and orderly marketing, including a careful study of available markets intelligence; the effect of present prices on future production.

Market surveys and different typs of organization necessary to carry the product from producer to consumer quite irrespective of the commodity to be handled;

Transportation problems; geographical situations in relation to various markets.

Ways and means of developing markets, including a special study of attractiveness of the product and its packaging; the significance of special brands and other means to increase consumption.

GENERAL

The Scientific Poultry Breeder's Association. Sixteenth Annual Register. Rev. H. Midie Draper. S.P.B.A., Rudgwick, Sussex.

Contents:

Calendar for 1931. Officers and Members of the S.P.B.A. Council. Foreword (P. Hedworth Foulkes, B. Sc.). List of S.P.B.A. Permanent Committees. List of S.P.B.A. Presidents The 1930 Annual General Meeting of the S.P.B.A: „Worms in Poultry" (T. Dalling and G. Warrack); „More high Priced Eggs with Lights" (Roland C. Hartman); „Spices and Minerals" (Tom Newman); „Do you make your Farm Play?" (H. R. Hunter); „„Size of Parent—Its Relation to Hatchability and Rearability" (C. E. B. Philcox); „Starting with Poultry" (Mich. F. Phelan); „Fowl Typhoid" (T. Dalling, M.R.C.V.S.); „Some Results of Culling on a Small Farm" (Mrs. T. Newman); „Breeds, Breeders and Breeding" (Miss M. Lawrence); „Coccidiosis and Hydrochloric Acid" (Mrs. M. H. Hazelhurst); „If I were Starting Poultry Farming To-morrow" (John Meekings); „A Plea for the Record Layer" (E. C. B. Boucher); „Everyday Questions—Foods and Their Analysis" (Tom Newman); „Inbreeding" (J. Edmondson); „Brief Hints on the Management of the Utility Duck" (James Pomfret); „The Work of the S.P.B.A. Experimental Farm" (Miss N. B. Maddison). List of County Poultry Instructors. Analysis Tables of Foodstuffs. Mineral Salts in Feeding Stuffs. List of Firms giving Discounts to Members of the S.P.B.A. Table of Railway Freight Rates by Passenger Train. Useful Weights and Measures. Postal Information. Weights of Grains and Meals per Quart Measure (Tom Newman). The Objects and Benefits of the S.P B.A. Extracts from Memorandum and Articles of Association of the S.P.B.A. Emendation of Articles. By-laws and Regulations of the S.P.B.A. Local Branches of S.P.B.A. Rules for Registration of Breeding Stock. The S.P.B.A. Accounts and Balance Sheet for 1929—30. The Register of the S.P.B.A. Breeding Pens. The S.P.B.A. Exporters' Roll. Inspectors under S.P.B.A. Exporters' Roll. Sectional List of Breeders' Names and Addresses. Names and Addresses of Members of the S.P.B.A. Index to Articles, 1914—31. Index to Advertisers. S.P.B.A. Notices. Calendar for 1932.

XVth International Agricultural Congress. Prague. 5-8 Juin 1931. Secretary's office: Dlazdena Street no. 2, Prague.

Poultry Science. 5th Section. Genetics, economic problems.

Exhibits the Farmer will remember. E. N. Holmgreen. Texas A. and M. College. Poultry Science, VIII, 86.

Many exhibits are a hodge podge. They are almost obscured with charts, diagrams, graphs and panels so heavily worded that the farmer becomes discouraged and leaves.

The question is how can we present the objects in a way that will first,

cause the farmer to stop at the exhibit, second, will tell the story quickly and simply, and third, leave a distinct and lasting impression of the worth of the idea.

Author now describes: Stopping Quality, Getting the Idea across, Making the Observer rember.

The Trend toward Confinement in Poultry Management. D. C. Kennard. Ohio Experiment Station. Poultry Science, VIII, p. 23.

Along with the brooding of chicks in confinement is coming the confinement of the layers for very similar reasons. This brings the question, can the layers be succesfully confined throughout the year?

The answer appears to be yes. Auther gives description of experiments at Ohio Station, and Egg Laying Contests.

Selling Poultry Husbandry to agricultural Students. H. C. Knandel, Pennsylvania State College. Poultry Science, VIII, p. 30.

If we are to sell poultry husbandry to our agricultural students we must be completely sold on our job of teaching.

Storrs Agricultural Experiment Station. Fortieth Annual Report. 1929. State of Connecticut, Public Document no. 34. Report of the Director.

Resumés of: Inheritance of Morphological Characters in Poultry. A genetic Study of Inbreeding in Fowls. The Behavior of a single Gene in Development. The Inheritance of Blood Grouping in Fowls. A comparative Study of the intradermal Tests and the Agglutination Method for White Diarrhhea. The Storrs international Egg Laying Contest.

The Durability of a Glass Substitute. Walter C. Russell and C. H. Howard. Agric. Exp. Station, New Brunswick, New Jersey. Poultry Science, VIII, p. 290.

Summary:

1. The rays of winter and early spring sunlight, which have to do with the prevention of leg weakness and the promotion of bone formation, were transmitted by a sample of the glass substitute, Cel-O-Glass, used after 13½ months of exposure to weather conditions, in an amount sufficient to produce the same effect with reference to bone formation as when the material was new.

2. The sunligt of the period, February 15—April 17, 1928, at New Brunswick, New Jersey, (about 40°30'N., 32 miles south-east of New York City) after passage through a new sample of the glass substitute, used as the vertical, south wall of a poultry house, was found to be sufficiently potent in the rays which have to do with the formation of skeletal tissue and the prevention of leg weakness.

3. Spectrographic measurements, made at a later date than the termination of the biological test, show a decrease in the percentage transmission with weathering, but the amount of any decrease which had taken place previous to the biological test was not sufficient to cause the degree of bone formation to be less than that which had been obtained with new material.

PHYSIOLOGIE AND ANATOMIE.

Study of the Heart Beat of Chick Embryo. Alexis L. Romanoff. Cornell University, Ithaca, N.Y. Poultry Science, VIII, p. 298.

Summary:

The results of these experiments definitely show that the heart beat of the chick embryo is not constant during the incubation; it was increasing up to 8 days and then remained somewhat even for the rest of the incubation period.

Rate of Feather Growth in Barred Plymouth Rock Chicks. J. Holmes Martin. Agric. Exp. Station, Kentucky. Poultry Science, VIII, p. 167.

Summary:

1. Barred Plymouth Rock chicks feather dimorphically with respect to rate, the males feathering more slowly.
2. Rate of development of feathers over the back is closely related to rate of growth, the heavier chicks feathering more rapidly.
3. In the two strains compared the exhibition chicks grew at a slower rate than the production-bred chicks.
4. Chicks of the exhibition strain did not grow as rapidly as did chicks that feathered at the same rate but were of the production-bred strain.
5. Slow feathering chicks in the strains compared were more common in the exhibition stock than in the production-bred stock.
6. There is apparently a physiological linkage between quality of barring and slow rate of feathering.
7. Female chicks that feather slowly over the back are poor winter layers.
8. High producing hens feather rapidly as chicks during the first three months.
9. There is no autosomal linkage between the gene or genes for rate of back feathering and M or E of Hays. There is no apparant linkage between the sex-linked gene E influencing early maturity, and the genes for rapidity of feathering.
10. The brownish cast of the black bars of many barred feathers is due to fewer melanin pigment granules (dilute).
11. In the exhibition strain observed slow feathering cockerels and pullets more nearly approached the standard exhibition requirements for quality of barring than rapid feathering chicks.
12. From among 21 exhibition pullets tested, those of the best quality of barring were below the average in rate of feathering and fecundity and the best layers were of poorer than average exhibition quality.
13. The feather tract over the ribs (costal) is the first to develop in the Barred Rock chicks observed.

Nutritional Leg-Weakness in Poultry. Factors influencing the Rate of Ossification in growing Chicks. R. J. Miller, R. Adams Dutcher and H. C. Knandel. State College, Pennsylvania. Poultry Science, VIII, p. 113.

Summary:

Experiments are described in which the bone-ash of White Leghorn chicks has been determined for the first eight weeks of life under various conditions of feeding and light treatment with the view of collecting data which may be used in future studies relative to the quantitative determination of the ossifying potency of anti-rachitic substances and the following observations may be made.

1. That the fluctuations in bone-ash in the tibiae of growing chicks are quite similar to those we have obtained in similar studies on the rat.

2. That the data obtained should enable us to repeat this type of experiment, using graduated amounts of rachitic foods and graduated amounts of light until we find that amount of food or light which will prevent the development of leg-weakness and maintain the bone-ash (for five to six weeks) at the level possessed by the newly hatched experimental birds at the beginning of the experiment.

3. The proposed application of the data obtained in this study should enable us to make quantitative comparisons of poultry feeds and various sources of ultra-violet light, as well as to study those environmental conditions which affect the transmission of calcifying factors to the egg.

4. While the experiments described in this paper were not planned with the view of obtaining detailed quantitative information at this time, the results indicate that irradiation (for 15 minutes daily) with the quartz mercury vapor lamp and with the blue-flame carbon arc lamp and by means of sunlight transmitted through Vitaglass and Cel-o-glass produced results in growth response and skeletal development comparable with those obtained with Newfoundland and Norwegian cod-liver oils.

Work is now in progress with the view of using the data obtained in this report to make a quantitative study of the bone depositing potency of some of our common poultryfeeds.

The Influence of individual Variation upon Nitrogen Metabolism Studies with Poultry. C. W. Ackerson, M. J. Blish, F. E. Mussehl. Dep. of Poultry Husbandry, University of Nebraska' Lincoln. Poultry Science, VIII, p. 1.

The relatively large coefficient of variability emphasizes the necessity of securing a large population in any one experiment before attempting to decide upon the relative biological values of various proteins. It demonstrates conclusively that isolated digestion trials, or even groups of a half dozen trials, may yield erroneous results. This may also serve to account for the discrepancies between reports of different investigators on the coefficients of digestibility of of similar poultry feeds. The reports found in the literature upon the subject have uniformly failed to take inconsideration the variations in nitrogen metabolism produced by molting, a factor which this paper points out as being very important.

Structures of Cartilage and Bones. Funktionelle Strukturen von Knorpel und Knochen und ihre Entstehung. Walter Landauer. Wilhelm Roux' Archiv für Entwicklungsmechanik der Organismen. Organ für die gesamte Kausaale Morphologie, 115 Band, 4/5 Heft, 1929. Verlagsbuchhandlung Julius Springer in Berlin.

Conclusions:

1. There are no proofs that functional structures are hereditary.
2. In the normal embryonal development the functional structures are determined by growth conditions of the bones themselves.
3. The bones can adopt themselves early in the embryonal life to external influences by the forming of functional structures.

TOME IV. No. 2 JULY 1931.

INTERNATIONAL REVIEW OF POULTRY SCIENCE

LIBRARY
RECEIVED
JUL 13 1931
U.S. Department of Agriculture

OFFICIAL ORGAN OF THE

WORLD'S POULTRY SCIENCE ASSOCIATION

600.000 MEMBERS

EDITOR
Dr. B. J. C. TE HENNEPE
ROTTERDAM (Holland)

This Review is free to all members of the World's Poultry Science Association.

All subscriptions should be sent to the Editor: Dr. B. J. C. te Hennepe, Rotterdam or to the Secretary-Treasurer: Dr. G. F. Heuser, Cornell University. Ithaca, N.Y., U.S.A.

SUBSCRIPTIONS

One pound or equivalent ($ 5.00) annually in advance.
The **personal membership** of the W.P.S.A.
For **affiliated societies** amounts to £ 1.0.0. / „ „ „ 5.0.0. per year

ADVERTISEMENT RATES

One page, per issue	£ 2.10.0
Half page, per issue	„ 1.10.0

Special attention is called for

BREEDERS' ADVERTISEMENTS

which are now fixed on **£ 2.-.- per full page, during 1 year.**

TOME IV. No. 2 JULY 1931.

INTERNATIONAL REVIEW OF POULTRY SCIENCE

OFFICIAL ORGAN OF THE

WORLD'S POULTRY SCIENCE ASSOCIATION

600.000 MEMBERS

EDITOR:
Dr. B. J. C. TE HENNEPE
ROTTERDAM (Holland)

PRINTED BY G. B. 'T HOOFT – ROTTERDAM (HOLLAND)

ROTTERDAM, 1st July 1931.

To our Readers.

An Expression of Satisfaction in Somber Times.

I am more than pleased with the fact that I am already able to give our readers **some information regarding the forthcoming World Congress at Rome.**

From articles published in poultry papers in many countries it would appear that **the interest for this congress is already very great.**

I look upon it as a very happy state of affairs that the **interest in the International Review has increased considerably recently.** It now forms an extensive international information service **which quickly concentrates and just as quickly spreads world news concerning poultry over the whole world.**

Our membership is continually increasing with the result that **the Review is now being read in not less than FORTY-NINE COUNTRIES.**

The number of **exchange periodicals is also continually increasing.** From the accompanying list you will see that we are regularly in touch with the **large number of seventy-eight periodicals from twenty-one different countries.**

Among these exchange periodicals the **poultry papers** naturally take the most important place but the following are also of great importance: — Official publications from various **Ministries of Agriculture,** of various **Experiment Stations,** and the **Veterinary Journals.**

Moreover the Review continually draws attention to the sources of its reports which is **a regular form of advertisement for the periodicals concerned.**

It will be a great satisfaction to you to learn in this number

of the discovery, by Professor de Blieck at Utrecht, of the Coryza-bacil. By this a step has been made on the road to a vaccin against this scourge of poultry farming over the whole world.

I have noticed frequently of late that **many poultry papers take over the resumes from our organ** and by this circulate the data among a much larger circle.

So in this manner **the Review is continually at work as a kind of Permanent International Congress.**

If our members will take upon themselves the task of sending me their publications regularly and will bring me in contact with periodicals which do not appear on the „exchange list" then I do not doubt that our work will extend considerably to the benefit of **International Co-operation in the field of Poultry Science.**

The Editor,

Dr. B. J. C. TE HENNEPE.

THE INTERNATIONAL REVIEW OF POULTRY SCIENCE IS EXCHANGED WITH THE FOLLOWING 78 JOURNALS. WHO FOLLOWS?

AUSTRIA. NUTZGEFLUEGELFREUND, Franz Josefs Kai 7-9, Wien I.

GEFLUEGELWIRTSCHAFT, Lichtenauergasse 5, Wien II.

OESTERREICHISCHE TIERARZT, Wallnerstrasse 6, Wien.

OESTERREICHISCHES ZENTRALBLATT FUER TIER- UND PFLANZENZUCHT, Eichgraben a/d. Westbahn, N.O.

ZENTRALBLATT FUER KLEINTIERZUCHT, Riemergasse no. 6, Wien.

AUSTRALIA. THE AUSTRALIAN VETERINARY JOURNAL, University of Sydney, Faculty of Veterinary Science.

AUSTRALASIAN POULTRY WORLD, 78a Victoria Str., Melbourne.

THE JOURNAL OF THE DEPARTMENT OF AGRICULTURE OF SOUTH AUSTRALIA, Victoria Square Adelaide.

POULTRY, Sydney, N.S.W. 32.

VICTORIAN POULTRY JOURNAL, Melbourne, Vic.

BELGIUM. AVISELECT, Rue Emm. Mertens 29, Bruxelles, Woluwé.

BULLETIN OFFICIEL, Les Colombes, Heide-Calmpthout.

CULTURA, Mr. Kessler, Nieuwstraat, Capellen.

LAND, TUIN EN NEERHOF, Baliestraat 97, Gent.

HET VLAAMSCH PLUIMVEEBLAD, Brussel, Woluwe.

CANADA. THE CANADA POULTRYMAN, 618 Homer Street, Vancouver.

THE CANADIAN POULTRY JOURNAL, Toronto 12.
THE CANADIAN POULTRY REVIEW, 184 Adelaide Str., W., Toronto.

CZECHO-SLOVAKIA. VESTNIK CESKOSLOVENSKE AKADEMIE ZEMEDELSKE, Dr. Eduard Reich, Prague.

ENGLAND. CHANTICLEER, E. Hugh Hudson, Chilworth near Guildford.
EGGS, Rudgwick, Sussex.
THE FEATHERED WORLD, 9 Arundel Street, Strand, London, W.C. 2.
HARPER ADAMS POULTRY JOURNAL, Newport.
LANCASHIRE UTILITY POULTRY SOCIETY'S REPORT, Richard Green, Farringdon Park, Preston, Lancashire.
MEMOIRS UNIVERSITY OF CAMBRIDGE, Department of Agriculture, Cambridge.
NATIONAL POULTRY JOURNAL, Milford, Surrey.
POULTRY WORLD, Link House, 4-8, Greville Street, London, E. C. 1.
THE JOURNAL OF THE MINISTRY OF AGRICULTURE, 10 Whitehall Place, London.
UTILITY RECORD, Official Organ of the National Utility Poultry Society, 53 Victoria Street, London, S.W. 1.

FRANCE. LE PETIT JOURNAL AGRICOLE, 61 Rue Lafayette, Paris.
LA REVUE AVICOLE, 34 Rue de Lille, Paris.

GERMANY. ARCHIV FUER GEFLUEGELKUNDE, Kaiser Wilhelmstr. 66, Berlin-Nieder Schönhausen.
DEUTSCHE GEFLUEGEL-ZEITUNG, Vaihingen a. d. Enz.
DEUTSCHE LANDWIRTSCHAFTLICHE GEFLUEGEL-ZEITUNG, Steinmetzstr. 2, Berlin.
EIER-BOERSE, Nürnbergerstr. 28, Berlin.
GEFLUEGEL—WELT, Georgstrasze 38/33, Hannover.
GEFLUEGEL—BOERSE, Solomonstr. 16, Leipzig.
GEFLUEGEL—FARMER, Lützner strasse 29, Leipzig.
ZUECHTUNGSKUNDE, Nikolausberger Weg 9, Göttingen.

HOLLAND. AVICULTURA, Misset, Doetinchem.

BEDRIJFS-PLUIMVEEHOUDER, Doetinchem.
DE KLEINVEETEELT, Heerenveen.
SCHAKELS, Maasstraat 106 II, Amsterdam (Z.).
TIJDSCHRIFT VOOR DIERGENEESKUNDE, Prins Mauritslaan 9, Den Haag.

HUNGARIA. STATISTIKAI HAVI KOZLEMENYEK, Keleti Károly, U. 7, Parterre 14, Budapest.

INDIA. THE INDIAN POULTRY GAZETTE, Narayangunj, E. Bengal.
THE INDIAN VETERINARY JOURNAL, P. Srinivasa Rao, Madras.

IRISH FREE STATE. JOURNAL OF THE DEPARTMENT OF AGRICULTURE, Dublin, C. 17.

ITALIE. BASSA CORTE, Salita Inf. S. Tecla 36, Genova.

JAPAN. JOURNAL OF THE JAPANESE SOCIETY OF VETERINARY SCIENCE, Prof. Naoshi Nitta, Faculty of Agriculture, Imperial University, Komaba, Tokyo.

NETHERLANDS-EAST-INDIA. LANDBOUW EN VEETEELT, Petjenongan 72, Weltevreden.
N. I. BLADEN VOOR DIERGENEESKUNDE, Bataviasche weg 54, Buitenzorg.

POLAND. THE POLISH ECONOMIST, Electoralna 2, Warsaw.

SOUTH AFRICA. THE JOURNAL OF THE S. A. VETERINARY MEDICAL ASSOCIATION, 61 Simmondsstreet, Johannesburg.
THE S. A. POULTRY MAGAZINE, Whiteco House, Box 286, Bloemfontein. S.

SPAIN. MALLORCA AGRICOLA, Granja Barcino, Consell-Baleares.
MUNDO AVICOLA, Arenys de Mar, Barcelona.

SWEDEN. SVERIGES ALLMäNNA FJäDERFäAVELS FöRENINGS TIDSKRIFT, Garvaregatan 7, Stockholm.

SWITZERLAND, DIE TIERWELT, Zofingen.

UNITED STATES OF AMERICA, ALABAMA NATIONAL EGG LAYING DEMONSTRATION PROGRESS REPORT, Alabama Polytechnic Institute, Auburn, Alabama.

AMERICAN POULTRY JOURNAL, 523 Plymouth Court, Chicago Ill.

THE BABY CHICK, 1230 West Washington Boulevard, Chicago.

EXPERIMENT STATION RECORD, U. S. Department of Agriculture, Washington, D. C.

GOLDEN BUFFS. New Albany, Indiana Bruce W. Ulsh, Owner.

HATCHERY TRIBUNE, Mount Morris, Ill.

HINTS TO POULTRYMEN, Agric. Exp. Station, New Brunswick, N. J.

INTERNATIONAL BABY CHICK NEWS, 3223 Troost Ave., Kansas City, Mo.

NEW ENGLAND POULTRYMAN, 4 Park Street, 2. Boston, Mass.

NEW JERSEY AGRICULTURE, Rutgers University, New Brunswick, N. J.

OHIO AGRICULTURAL EXPERIMENT STATION, BIMONTHLY BULLETIN, Wooster, Ohio.

"OK" POULTRY CULTURE, 2607 North Boston Place, Tulsa, Oklahoma.

POULTRY CRAFTSMAN, 327 Towne Avenue, Los Angeles, California.

POULTRY PROJECT BULLETIN, Mich. State College of Agriculture, East Lansing, Michigan.

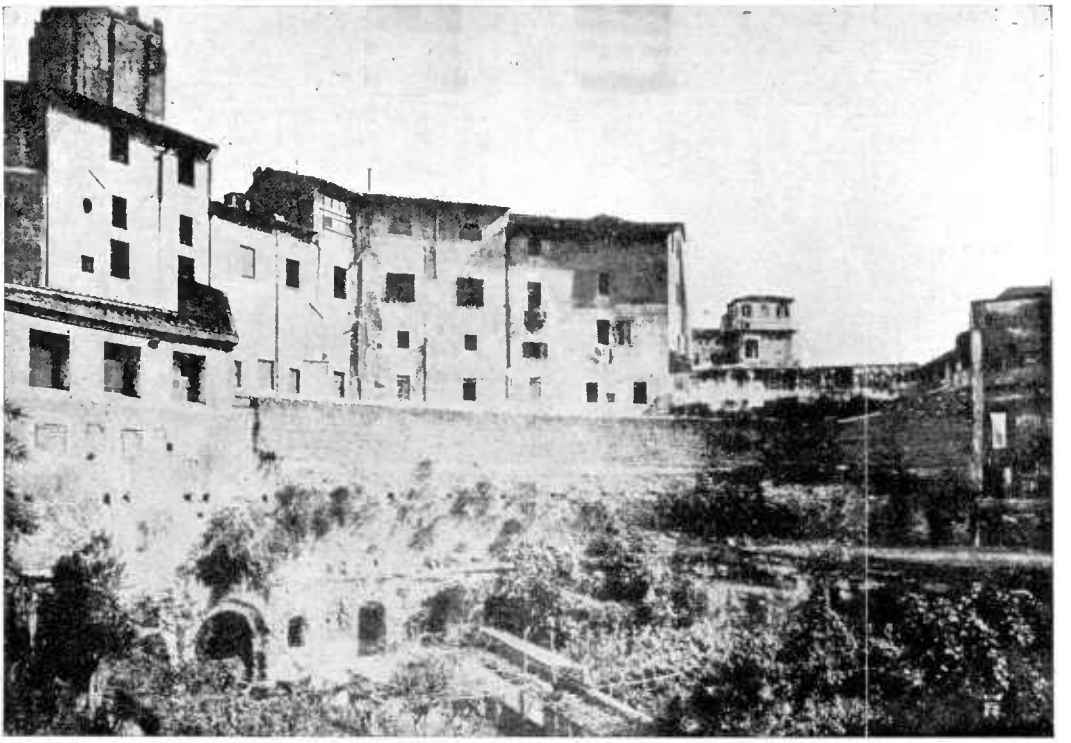
POULTRY SCIENCE, L. E. Card, Urbana, Ill.

POULTRY TRIBUNE, Mount Morris, Ill.

POULTRY ITEM, Sellersville, P.A.

RELIABLE POULTRY JOURNAL, Dayton, Ohio.

U. S. EGG AND POULTRY MAGAZINE, 110 North Franklin Street, Chicago.



THE FORUM BEFORE EXCAVATION.

THE CAPITOL.

THE FORUM DURING EXCAVATION.

THE FIFTH WORLD'S POULTRY CONGRESS ROME 1933

THE FORUM OF TRAJANUS
THE CAPITOL
and
THE INTERNATIONAL INSTITUTE OF AGRICULTURE.

After 2000 years the cocks will crow again in the Forum of Trajanus.

by Dr. B. J. C. te Hennepe

In consequence of the decision made at the meeting of the Council in Paris on the 14th February, of which a report was published in the International Review IV No. I, I went to Rome on the 7th April.

On the 9th at 10 o'clock in the morning Professor Castelló and myself were at the Ministry of Agriculture where we were received by Dr. E. Coortis, Chief of the Department for Zootechnic of the Ministry of Agriculture, Professor Ghigi, Director of the forthcoming Congress and Professor F. Clementi, Chief of the Poultry Department at the Royal Agricultural School in Rome.

In the company of the above mentioned gentlemen the so-called Forum of Trajanus was visited and after having seen all the rooms and held various discussions, Professor Castelló and the undersigned were fully agreed that this building would be admirably suited to the purpose of the exhibition.

Much will have to be done before it can be taken into use as exhibition premises but the authorities concerned assured us that there need be no doubt whatever about getting it in readiness.

Afterwards we made our decision concerning the place of the exhibition known to his Excellency Minister Acerbo, who accorded us a friendly reception, and to Dr. M. Mariani, Director-General of Agriculture.

The premises of the International Institute of Agriculture was considered as a place where the sessions of the Congress could take place.

We visited the various rooms, which appeared to be excellently suited. The great quiet which reigns round the building, which stands practically alone on the hill, is a great advantage, so that the objection of the difficulty in being able to understand each other, which has been raised at other congresses, will be done away with here.

The opening and the general closing sittings of the Congress will be held in the large hall of the Capitol, one of the best historically known places of the world. Professor Castelló and I also paid a visit to this place and admired the buildings and the hall and the wonderful view that one has from the buildings.

At a place, famous all over the world on account of its poultry, namely the place that was saved from an ennemey's attack by the noise of geese, poultry people from all parts of the world will meet, while moreover the famous market of Trajanus after having been unused for about 2000 years shall once more be used for its original purpose, namely, as a place where the goods of merchants are exhibited.

These two famous historical facts offer an attraction for the forthcoming congress which were absent from other congresses.

That for other reasons too Rome and Italy will attract many foreigners cannot be doubted and our kindly host, Professor Clementi, showed us much in the short time at our disposal in Rome that I am sure will be of great interest to congress visitors.

For instance on Sunday we made a trip along the Via Appia, the catacombs and the chapel; Domine quo vadis? to the Campagna di Roma and the Royal Agricultural School.

Here we were received by the Director Professor M. Marinucci. It was just the first Sunday of the Poultry Course and Professor Castelló made an openings speech to about 300 students which was received with thundering applause.

Afterwards the poultry experiment station of Professor

Clementi was visited and we were offered a drive to Castelgandolfo in the mountains of Albano. Here on the shore of the beautiful lake of Castelgandolfo we were the guests of Commander Clementi. Then, under the guidance of Avvocato Bonomelli we visited the new country seat of the Pope, where there were already a few pens of poultry.

We have retained a grateful memory of this trip and of the interesting places which Rome and its surroundings offer and of the spontaneous hospitality of our Italian hosts and wish to take this oppurtunity of expressing our most sincere thanks to them.

As our members will undoubtedly be interested to hear further regarding the historical place where the next Exposition is to be held, I have studied a few points in connection with this which will follow hereafter. They are taken chiefly from the profound studies by Dr. H. M. R. Leopold, who published them under the title of „Onder de Leerschool van de Spade" (The School of the Spade) in one of the largest Dutch Newspapers, the „Nieuwe Rotterdamsche Courant".

The Forum of Trajanus.

The Forum of Trajanus is situated in the centre of the old Rome. Up to a few years ago travellers were shown of this „the Column of Trajanus", around which there is a large square covered with rows of broken pillars, the so-called „Basilica Ulpia".

When, under the new regime, a large number of modern town houses had been pulled down and cleared away more parts of the one time enormous building were laid bare and it is now considered that **a solution has been found to a mysterious text which was to be seen at the foot of the column of Trajanus.**

The famous column of Trajanus is now situated in the middle of the remains of the large square of Trajanus. It was saved from absolute ruin because the statue of Trajanus at the top had been replaced by one of St. Peter. Wound spirally round the 40 metres high column is a relief which in a masterpiece of workmanship shows a record of the wars which Trajanus fought against the Dacians in the districts which now belong to Rumania.

At the foot of the column there is some writing dating from the year 113 in which absolutely no mention is made of the deeds of Trajanus, but reads as follows:

„Ad declarandum quantae altitudinis mons et locus t[antis oper]ibus sit egestus" (to declare to what height a hilly site for such large buildings is dug away).

Up to a few years ago this text has always been thought to mean that where the column now stands there was formerly a hill of the height of this column which was levelled off in order to make way for a thoroughfare through the town.

When, in 1812, however, the remains of older buildings were found under the Forum, people began to doubt the words of this text as it appeared that in the time of Trajanus there no longer existed a hill which had to be levelled off. The uncertainty regarding the meaning of this mysterious text increased considerably when, in 1905, Giacomo Boni found the remains of an old street paved with basalt blocks at a depth of about 1½ metres under the foot of the column.

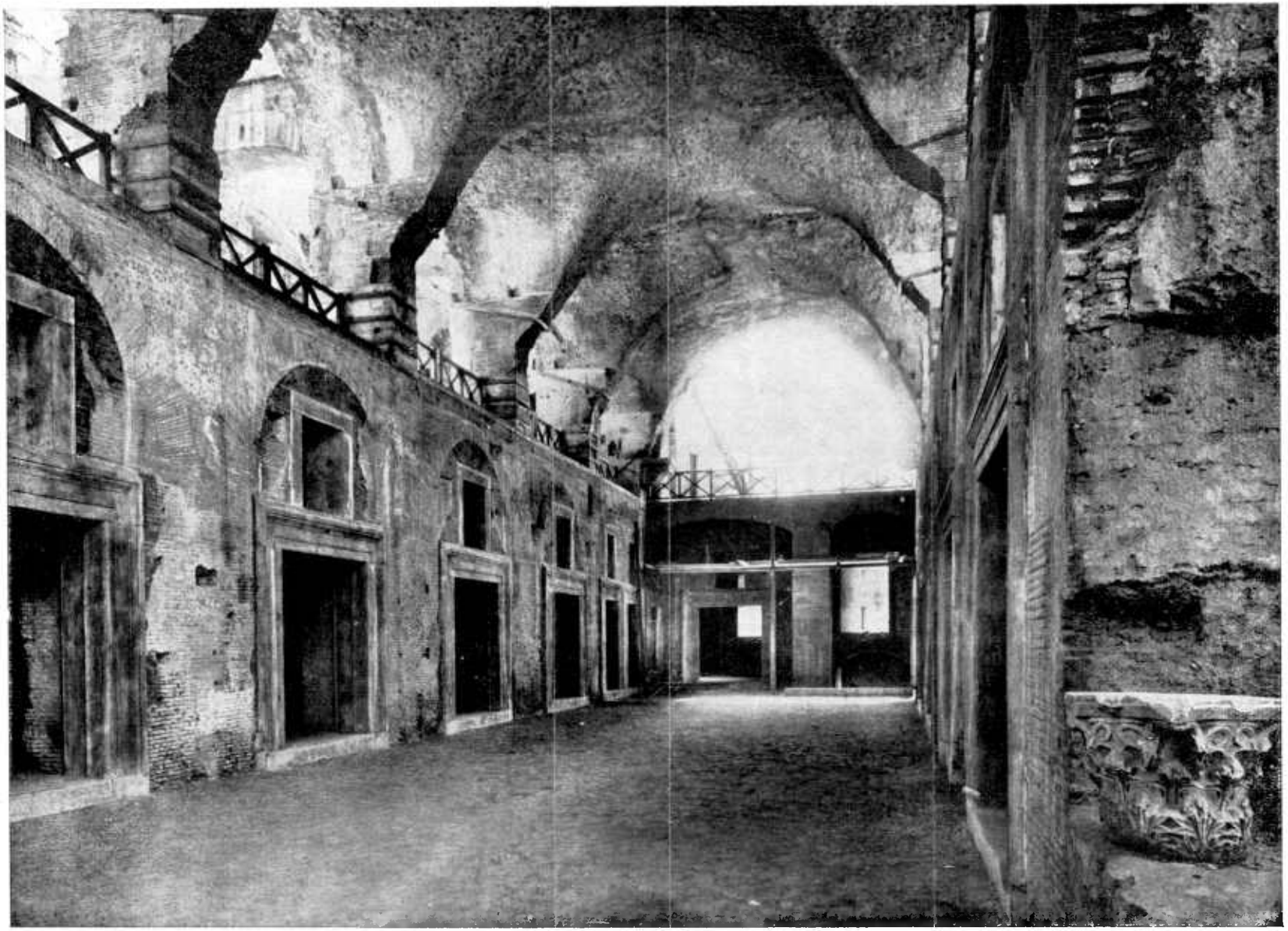
Since then numerous explanations of this apparently simple text have been attempted but none of them appeared to be satisfactory. It was only recently, when more of the Forumn itself was discovered, that a solution of the riddle was found.

The Forum of Trajanus must have been a wonderfully beautiful building. Ammianus Marcellinus, historian of Emperor Constantine in the 4th century relates: „But when he, (Constantine) came to the Forum of Trajanus, a building which is unique under heaven, and which, in my opinion, should be admired even by the gods, he remained as if stunned and allowed his gaze to roam over this gigantic construction, which cannot be described in words, and of which mortals cannot dream of a second creation."

But also about the year 500 the Forum was still so beautiful, according to the evidence of a Roman of the time of the Goth King Theodoric the Great (493—526), „that it resembled a wonder".

When, in 1812, the French Governor in Rome began to clear away the ruins round the column of Trajanus nothing more than a few blocks of yellow marble were found. The pieces of granite pillars which one now sees arranged in rows on the square before the column are absolutely unworthy of the surroundings and can at most only have served as part of the decoration of an outside wall.

The question was asked: „Where are the beautiful pieces of the old Forum"? The solution was given when the accounts were found for work in connection with building during the time of Pope Pius IV and afterwards when accounts were found regarding



THE MAIN ENTRANCE IN THE VIA NAZIONALE.

deliveries of yellow marble from the convent of the nuns of the Holy Ghost at that place.

One of the bills which was paid to the convent on the 15th January 1564 reads as follows: „fls. 150.— for 12 cart-loads of yellow marble". (During my visit to Rome I bought several paper-weights of all kinds of beautiful marble which, it is said, are made of waste from the old Roman ruins. The tactic of the nuns of 1500 appears to be still carried on in a modified manner)!

There is thus practically nothing left of the wonders of Trajanus. This is the opinion of Dr. Leopold which is contrary to that of all writers up to Pariboni.

It was assumed that even if nothing remained of the beautiful centre piece of the covered square, the so-called Basilica Ulpia (the pillars which are now standing there do not belong to this) *still one of the Apsides, which are supposed to have stood on each side of the oblong building, has been preserved in quite good condition.*

These remains of the forum would thus be the premises destined for the World's Poultry Exhibition. Even this beautiful illusion has been dispelled by recent excavations.

The building which Professor Castelló and I inspected and which was laid bare by the last excavations carried out by the municipal authorities, has a brick facade and is paved with basalt blocks. There is an excellent description of this is Pariboni's work and because it is of the greatest importance to our object I will repeat a few of his sentences:

> „The Apsis leans against the Quirinalis and has remained „almost whole. It consists of a two storied building with a „facade of beautifully worked bricks and decoration of „travertine. Behind this facade there are rooms and stairs. „The half circle has a radius of 100 feet and from the „pavement to the cornice the height is fifty feet. There seems „to have been a balustrade on the cornice. The brick facade „does not appear to have been decorated. The ground floor „shows a row of shops with low wide doors with jambs and „doorsteps of travertine. Above the doors there are large „windows. Two of the openings do not lead into shops but „to broad staircases which lead to the second floor. On the „top floor there is a row of twenty-five high windows under „a protuding ledge crowned with figures, some in the shape „of a semi-circle and others triangular with the slanting side

„downwards. At the end of the half circle there are two „niches instead of two windows. The floors of the rooms are „of simple black and white mosaic and the floor of the hemi- „circle is of basalt."

During the last excavations is was found that between the marble floor of the Forum and the basalt floor of our building a heavy wall had stood of which the remains have now been found.

The following conclusion can be taken from this:

The building which we inspected does not belong to the Forum of Trajanus and was separated from this by a heavy wall so that this building could not even be seen from the Forum. Of the wonderful work of the Greek Apollodorus who placed his talents at the service of the Emperor Trajanus there is nothing more remaining than a few marble flooring stones and fragments of architecture. The column is a gift from the Municipality of Rome to the Emperor and the brick building that we saw was part of another large building that was planned by the city of Rome and to which the mysterious inscription on the column referred.

And now finally we asked ourselves *what was then this brick building which is now to be prepared for the World's Poultry Exhibition?*

Let us imagine ourselves back in the days of Trajanus. The Forum which he had built was erected in the middle of a busy thoroughfare surrounded by houses and shops. This shopping street was pulled down and in order that the traffic should not be hindered a new street was built outside the Forum. In order to make room for this a part of the Quirinal hill was dug away. As however the whole shopping street had disappeared a genial solution was found by building new shops in the rock itself. These were bored out in two stories being joined together by means of staircases. In this way a large number of new shops were created within a very small area.

Above the upper shops another street was laid, entrance to which was attained on both sides by means of staircases. The open side of the street was provided with a balustrade and on the mountain side shops and houses of three stories high were built. From this street one obtained a wonderful view over the town.

The upper houses reached almost to the top of the Quirinalis on the top of which there is another large building. This building which could be reached by way of the either of the two streets was

for many years used as a barracks. When the archaeologs began to pull down this building they discovered under a layer of lime, a brick wall of the kind that had not been made since the time of the Roman Emperors. *It soon appeared that here on the top of the Quirinal was another old Roman building, a covered market.*

From the Via Nazionale one enters an oblong room spanned by gigantic arches. On both sides of a broad middle aisle are enormous pillars of brick on the top of which, right and left, is an upper story. Both on the ground floor and the upper story two unbroken rows of rooms open on to the centre. The lower rooms are larger than the upper as here space had to be saved for a corridor.

This large hall with its two storys of shops one above the other fully resemble the modern shop galleries or covered arcades. *In no other ancient town has anything been found as yet which can compare in efficiency with this splendid building.* In this case the Roman architect has found a genial solution of a difficult traffic and housing problem which was created by the building of the Forum of Trajanus.

The brick building decorated only by travertine of the door-posts and doorsteps indicates economy and efficiency which is quite contrary to the luxury of the Forum, which was built of marble.

From the above review it will be seen how the forthcoming exhibition will be housed in an old Roman shop gallery. Where formerly the old Romans had their market place and exhibited their goods, the cocks of many countries of the World will crow and the old Roman market will relive through the modern World Poultry Congress.

I hope to be able to publish plans of the building and measurements of the various rooms in a following number. From the covered market on the top of the hill one obtains an unforgetably beautiful view over the town and its surrounding, while on the front looking to the right the enormous ruins of the Therms of Diocletianus can be seen.

THE APSIS DURING OUR VISIT.

At the left the remains of the heavy wall between the Forum and the building of the Municipality of old Rome. In the middle on the fourth story the wide arches of the Main Entrance on the top of the Quirinal Hill.

BREEDING

Investigation into the differences between Barneveld and White Leghorn breeds from a genetical and breeding technic point of view. Report to the Committee of the Netherlands Genetic Society regarding breeding tests with poultry in 1926-1927 and 1928-1929. A. L. Hagedoorn. Züchtungskunde, 1930, p. 450.

The investigation was carried out in four directions: 1) It was to be ascertained whether a correlation exists between various continuing characteristics appearing in combination in two breeds of poultry (Aziatic and Meditteranean breeds) (coloured eggs, white eggs, white ears, light body weight and early puberty in the other). 2) It was to be investigated whether it was possible to incorporate the qualities of „Brown Egg" and „Early Puberty" in a good laying utility breed. 3) The question was to be treated what gens have influence on the colour of the egg, the colour of the plumage, the colour of the feet etc. 4) Finally data, relating to the value of cross-breeds and their progeny as utility poultry were to be gathered.

For the answer to the first question tests could be made as to whether the qualities mentioned also appeared in the same combination in the progeny of crosses between aziatic and mediterranean breeds, thus in the F_2 generation, as in the original breeds. The second question is theoretically solved by the answer to the first. The really practical breeding of this new species would be another proposition. The birds of the F_2 generation offer the test material for the bird analysis of hereditary. In the solution of the fourth question a so large as possible F_2 generation must be bred in order to examine the birds in regard to their qualifications, especially their laying capacity.

The material used consisted originally of two Barnevelder hens and one White Leghorn cock. As it is known that Barnevelder often hatch hens which lay light coloured eggs, it was necessary for this investigation to use only birds from the abovementioned crossings and not the contrary crosses.

1. The investigation regarding the correlation between simultaneously appearing qualities was carried in such a manner that it concerned the question as to whether, in the second generation, a correlation existed between: ear-colour and egg-colour, body-weight and egg-weight, body-weight and relative egg-weight, body-weight and egg-colour, body- weight and ear-colour, body-weight and puberty, puberty and egg-weight.

In connection with this correlation tables were drawn up which showed the following results: No correlation was found between ear-colour and egg-colour. It is true that there is correlation between body-weight and egg-weight but in proportion to their weight the heavier hens laid smaller eggs than the light ones. There appears to be a small correlation between body-weight and ear-colour. Correlation between body-weight and early puberty did not appear

to exist. There was no correlation between early puberty and egg-weight nor between ear-colour and relative body-weight.

2. All crosses between White Leghorn and Barnevelders were white, with the exception of red feathers (but only those!) in a few cocks and the appearance of small colour spots in both sexes. The results of other investigations were for the remainder, confirmed by this, in so far that the majority of them ascribe the white colour in such cross-breeds to a so-called white gen, which will suppress all other pigment. In the F_2 generation these cross-breeds split again and through new gen-combinations birds might easily be produced from this F_2 generation with unknown qualities. According to the correlation table drawn up it should, in principle, be possible to breed birds which lay brown eggs and which are quickly on the lay, thus White Leghorns with brown eggs. According to the writer there are markets on which eggs of a certain colour are demanded.

3. From experiments with white Barnevelders it was ascertained that plumage-colour and egg-colour are independent from each other. The yellow leg colour of the Barnevelder is other than the yellow leg-colour of White Leghorns. The Leghorns have dominant yellow legs and the Barnevelders recessive yellow legs. The darker colour of the legs of Barnevelder is caused by a gen which the Birds with light yellow do not possess. The action of this gen is therefore arrested by a sexually connected gen in the Leghorn. The difference in the egg-colour in the two breeds is caused by various gens. There can be no question therefore of a generally dominant lighter or darker egg-colour.

4. In practice therefore these investigations would prove that early puberty with light body-weight and small eggs are not connected, except that it is quite possible to breed poultry which lay a large dark coloured egg and still attain puberty quite early. On the other hand, as the brown egg-colour of the Barnevelder is not its only good quality, by crossing this with the early puberty and great laying capacity of the Leghorn, it should be possible to re-unite the excellence of these two breeds by the production of a new breed from the crossings of the two or by improved crossings of one of the two. The last named method is usual in practice.

Skin transplantation as a means of studying genetic and endocrine factors in the fowl. Danforth C. H. and Frances Foster. Journal of experimental Zoology, 1929.

Numerous experiments have shown that the sexual variations in the plumage of domestic poultry and relative birds result from hormon action. It is only a question therefore, to ascertain in particular cases what components are hormonally modifying in the formation of the plumage. For this purpose the writers made experiments in skin transplantation by poultry and all the operations were carried out directly after hatching. First, pieces of skin (mostly from the back) of individual birds of various breeds and of the same sex were exchanged. It proved that the contour feathers formed from the transplants were identical in detail with those of the giver:

The following were transplanted: 1. Dominant white (Leghorn) on to brown Leghorns, black Minorcas, Rhode Island Reds, barred Plymouth Rocks, Gold Campines. 2. Black (Minorca), Red (Rhode Islands), Gold (Campines), Black and Sebright Markings (Bantams) on to dominant White Leghorns. 3. Recessive white (Plymouth Rocks) on to buff Orpingtons and vice-versa. 4. Recessive white (Silkeys) on to barred Plymouth Rocks and on to dark Bantams. 5. Gold (Campines) on to white Silkeys and barred Plymouth Rocks. 6. Wild-colour (Italians) on to black Minorca's and barred Plymouth Rocks.

7. Barred (Plymouth Rocks) on to brown Italians, black Minorca's, Rhode Island Reds, Gold Campines.

Further the writers transplanted pieces of skin from quick feathering breeds on to slow feathering breeds and vice-versa so that they had some control. The feathering rate of the transplants appeared also to follow the type of the giver.

First, however, in the breeds mentioned, skin transplantations from the cock of one breed to the hens of another were carried out. It proved that the feathers of the transplants behaved as the feathers of a bird of the colour sort of the giver and as the sex of the receiver.

Also with other hormons, f.i. thyrcoid, the transplants on to capons reacted as was to be expected from results obtained from earlier experiments. So, through these experiments, our ideas of certain characteristics of hormoned and genetal limitation were decidedly confirmed and completed.

The Inheritance of Egg Weight in the domestic Fowl. Frank A. Hays. Journal of Agricultural Research, T. 38, Nr. 9, 1929. 1929.

Investigations have repeatedly shown that big poultry lay big eggs and that chickens hatched from such eggs have an increased vitality. The trade demands a standard size of 56,7 grams per egg. Eggs from ordinary laying hens usually reach this standard but early puberty is connected with diminution of the egg-weight. It follows therefore that early puberty and big eggs must be looked upon as a case of inheritance.

The writer's investigation was concerned with the egg-weight of 105 Rhode Islands Reds which were hatched in 1927. Special attention was paid to the individual changes in the size of the egg in each separate month. A young hen should lay eggs of an average weight of 52 grams in November in order to reach the standard by March, in December the weight should be 55 grams. In Rhode Islands Reds which have been bred for laying purposes the full egg-weight is reached in the 2nd laying year and does not increase afterwards.

An inheritance experiment with 526 hens, descended from birds which had for 14 years been specially bred for laying purposes and 5 cocks showed that the egg-weight is dependent on multiple inheritance factors: the egg-weight curve is multimodal. The average weight of the whole group was 49,7 grams, the majority of the birds did not therefore comply with the demands of the standard. Results showed that high egg production is accompanied by small egg-weight ($r = 0{,}3673 = 0{,}02543$). After the regressions co-efficients the hens with an average of 52 grams egg-weight showed a production of 43,47 eggs during the investigation period but in reality there was an average of 42,93 eggs. Smaller egg-weight appears to be connected with increased winter production. According to the weight of the eggs laid up to 1st January four groups could be formed: less than an average egg-weight of 47 grams, 48—49 grams, 50—51 grams, 52 grams and over. Probably in the formation of most of the modern breeds of poultry a gen has developed which limits the size of the egg fairly well so that the average hen now lays a moderately large egg, but need not be unlimited homozygot for this gen B. Further a dominant gen (A) has appeared for small egg form (less than 56,7 grams). Gen A is epistatic against B. birds with A and B will therefore lay small eggs. Birds with only A lay smaller eggs than those with the genetic form AB, birds without both (aa bb) lay very small eggs, only aB birds lay standard eggs.

The probably gentypes for egg size are:

aabb, AA bb, Aabb eggs of 47 grams or less until 1 Jan.
AABb, AaBb „ „ 48—49 gram „ „ „ 1 „

AABb, AaBb „ „ 50—51 gram „ „ „ 1 „
aaBB, aaBb „ „ 25 grams „ „ „ 1 „

A test with relative birds to those investigated showed that the egg sizes observed agreed fairly well with what was expected from the genetic constitution. Breeding egg size alone without regard to number seems to be a rather simple precedent.

The influence of the age of hens at the commencement of laying, on the weight of the eggs, egg production, and body-weight. Ueber den Einflusz des Alters der Hennen beim Legebeginn auf Eigewicht, Eierproduktion und Körpergewicht. Prof. Dr. J. Schmidt und J. Zöllner. Institut für Tierzucht der Universität Göttingen. Züchtungskunde, 1930, p. 352.

Half of the hens examined began to lay at the age of from 5—6 months. The majority of birds are still growing at this age as growth does not cease untill the age of one year. The stage of development at which the hen is when the first egg is laid has great influence on the weight of these first eggs. Even a difference of one week in the age of the hen exercises great influence on the weight of the first laid eggs.

The average during the first year of laying is also influenced by the age of the hen when it begins to lay. The average weight of the hen during the first year in which it lays can be approximately stated from the weight of the first eggs.

The average body weight of hens which begin to lay late is greater than that of hens which begin young.

Illumination of Hens during Winter. Untersuchungen über die Beeinflussung der Legetätigkeit von weiszen Wyandottes-Hennen durch Stallbelichtung und über die Auswirkung der Belichtung auf die Befruchtungsziffer und Schlüpfergebnisse der Bruteier. Hans Peter. Biologia Generalis Bd. 5, 1929. (Ref. Züchtungskunde, 1930, p. 460.

Various groups of laying hens were subjected to the light test, sometimes two, sometimes four hours, with lamps of various strengths and their laying capacity for a period of 92 days compared with that of other hens, which had not been subjected to the test. The highest figures were obtained from a four hour illumination with lamps of about 300 Watt. In total the results of the four hours illumination were far better than those of the two hour lighting. Compared with the current used the group subjected to the 2 hours illumination with lamps of 60 Watt showed the best results. The strength of the light intensity does not appear, therefore, to be a decisive factor but on the contrary the duration of the illumination appears to be so. There was practically no difference in the fertilisation and hatching results between the various groups which had been subjected to the tests and those which had not .

Investigations regarding the laying capacities of White Leghorns. Untersuchungen über die Legeleistung von Junghennen weiszer Leghorns. J. Hauschildt. Institut für Tierzucht, Universität Göttingen. Züchtungskunde, 1930, p. 251.

Investigations were made with 295 White Leghorns. Two sharply defined periods can be distinguished in the egg production: 1) from August to December, 2) from the end of December to October.

The weight of the eggs reached its maximum in February-March. This increase agrees with that of the length and breadth measurements of the eggs.

The weight of the body, the number of eggs laid and number of hens all decreased considerably in November. This was in connection with the moulting period. The loss of weight does not occur during but before the moult. Hens which did not moult during the moulting period did not lose weight.

The feeding of albumen in order to make up for the loss of the feathers should not therefore take place during but before the moulting period.

There is positive correlation between body and egg weight. As the body weight increases so the weight of the eggs increases. There is also positive correlation between the length of the lay and the distance of the pelvic bones. There is a clear connection between the beginning of the lay and the laying capacity. There is positive correlation between winter and total laying capacity.

Increasing production on a Modern Poultry Farm. Die Steigerung der Leistungen in einer neuzeitlichen Hühnerzucht. R. Römer. Lehr. Versuchsanstalt für Geflügelzucht. Halle a/d. S. Cröllwitz. Züchtungskunde, 1929, p. 201.

Description of the methods employed at Halle-Cröllwitz in order to breed heavily built hens, which lay many and large eggs. Numerous tables give an oversight of the laying figures in comparison with those of other countries.

The influence of ultra-violet rays on hatching. Influence des rayons ultraviolets sur l'éclosion des poulets. M. Cholevcuk. Comptes rendus de la Soc. de Biol., 100, P. 586, 1929.

Former investigations by Hinnrichs (Journ. exper. zool. 47, 1927) gave no definite results. The experiments of the writer were carried out in three groups with a quartz-lamp and warm water incubator in the months of June, July and August. Each experiment included a control group of eggs from the same hens; the duration of the ray treatment varied between 1 and 20 minutes. The first treatment was given before the eggs were laid in the incubator, the second after 3 days. Than treatment was given daily until the 19th day; the distance of the lamp was 60 cm. The eggs were tested on the 7th and 17th days. As compared with untreated eggs those which had been subjected to the rays showed an increase of 18,7 % in the hatching result. A daily treatment of 15 minutes seems to be the most active. The vitality of chickens from eggs which had undergone the ray treatment was considerably greater than of those from the the untreated control group. Mortality among the former varied between 0 and 20,8 % and among the latter between 7,6 % and 57,8 %. There was no difference between the two groups in the increase of weight.

The nature of racial and sexual dimorphism in the Plumage of Campines and Leghorns. Biologia generalis, 1930. Ref. Züchtungskunde, 1930, p. 462.

Earlier experiments by Greenwood already pointed to the fact that not all breeds with hen feathered cocks were the same with regard to the cause of the differentiation of the plumage. The foregoing experiment confirmed the assumption that as regards this Sebrights and Campines are opposites.

The writer has investigated this problem with the help of his proved method of transplantations of pieces of skin. The following were the results:

1. Transplants of skin from Leghorn hen on to Campine cock and vice-versa showed a differentiation of their feathers according to the type of the giver.
2. The same was the case with transplants from Campine or Leghorn cock on to corresponding hens. Feathers were similar to the hen of the givers.
3. Transplants of Leghorn hen on to Leghorn cock formed feathers similar to those of the receiver.

   In so far the results agree with those of earlier tests as regards the fact that the breed characteristics of the feathers incline towards those of the giver and the sex characteristics towards those of the receiver. If however
4. the skin of Campine hen is transplanted on to Leghorn cock. The majority of the feathers of the transplants are more „female" differentiated.

From this it must be assumed that the hen-featheriness of Campine hens is not as usually hormonally caused but through a special reaction of the skin. It is also brought about in the absence of ovarial hormons. But, as in such transplants some few feathers occur which resemble the feather type of cock-feathered cocks in structure and pigmentation, it appears that not all feather follicles act in the same way. The possibility that an age dimorphism plays a role here is excluded. From his experiences the writer concludes that Leghorns and Campines not only distinguish themselves in the manner in which the skin reacts but also in the hormonal stimulation.

White mottled Birds in brown Leghorns. Das auftreten weisscheckiger Tiere bei rebhuhnfarbenen Italienerkücken. R. Fangauf. Archiv für Geflügelkunde, 1929, p. 43.

Proportionately speaking, purely white feathers are frequently found in the young plumage of coloured poultry breeds. After the first moult such feathers are usually replaced by normal coloured feathers. There is no reason therefore to exclude such white feathered young birds from a breeding flock. It also frequently happens that faulty stripes appear on some of the young feathers, i.e. various light coloured bands which are the result of a disturbance in the pigment formation. The exact cause of this disturbance is not known.

Downless Chickens. A. S. Serebrovsky and S. G. Petroff. Journal of Heredity, 1929, p. 331.

Of 16.000 chickens bred at the Genetic Station in Moscow there were three whose down plumage on hatching did not show the normal formation. One of these chicks was completely downless, the other two being covered only with embryonal down. On investigation it appeared that these three chickens came from an inbred flock. From one pairing there were 2 downless chickens among the 12 and from another 1 downless and 14 normal. This would prove that it is a question of heredity but this can not yet be analysed. As none of the downless chickens lived after hatching the possibility of a lethal action of the gens involved might be considered.

An experimented analysis of the plumage of the Brown Leghorn fowl. A. W. Greenwood and J. S. S. Blyth. Proceedings of the royal society Edinburgh. Vol. 49, p. 313—355. 1929.

Numerous experiments during recent years have proved that the presence of an ovary in domestic poultry in both sexes occasions a female variation of the plumage, while the testicles have really no influence on the formation of the plumage and that even after implantation in a hen they had no influence on the normal variations of the feathers. After ovary ectomy the hen also affects a male type (asexual) plumage. In the breeds with hen feathered cocks the female feather formation in the male sex is not, however, connected with the presence of an ovary, neither do the testicles in this case form a definite female plumage hormon as testicles of breeds with normal cocks implanted in the male castrates of these breeds still allow the formation of hen feathers.

The thyroid gland is also of importance to the variation of the feathers. After being fed with thyroid gland four cocks and male castrates show a plumage which inclines to the female type. According to this after thyroid ectomy a hen ought to show male plumage as that indicated by Crew as hen feathered cocks. Such investigations are now being carried out on a larger scale.

Body-weight and growth of young animals without thyroid glands experience a check according to the completeness of the operation. The commencement of female puberty is not influenced. The weight of the egg is also unchanged. After pairing with thyroid glandless cocks, hens without thyroid glands laid fertile eggs from which chickens in the proportion of 34 males: 35 females were hatched. After incomplete thyroid ectomy the regeneration capacity of this gland is very great. It appears that new follicles form on the peripheri of the gland tissues which is contrary to the theory of Uhlenhuth and Wilson. Under the influence of hypotyreoidism the plumage of cocks and hens becomes more wavy. By the loss of the hooks the large surfaces of individual feathers become silky. As regards pigmentation red pigment is dominant.

After feeding with thyroid gland food, laying ceases, comb and wattles become pale. The plumage of the hen becomes darker: gray becomes black, the red tones disappear, the structure becomes somewhat closer. The plumage of the cock becomes black, the hooks are increased and through this the beard of the quills appears to be structured as in the hens.

After removal of the thyroid gland the plumage of capons changes as in corresponding cocks, only to change again to the normal type after feeding with thyroid gland food.

From these experiments the theory has developed that in the case of cocks the differentiation of the plumage is only dependent on the thyroid gland and not on the sexual gland.

In the case of hens the corresponding thyroid gland functions are increased through the influence of the ovary. Moreover the gonade will also have a direct influence on the plumage papilla.

The young feathers of cocks and hens resemble the female type very closely. This fact probable has its origin in the resorption of the yolks and in the females moreover in the commencement of the functions of the gonade. It has been confirmed by experiments that the feeding or injection of egg yolks influences the plumage of full grown poultry in the female direction. In a number of hen-chickens the plumage was changed to the male type by implantation of testicles. The writers believe that in this early stage the testicle hormon can temporarliy suppress the function of the ovary.

A case of Alopecia in the Fowl. C. H. Danforth. Journal of Heredity, 1928, no. 12. Ref. Züchtungskunde, 1929, p. 220.

The cases described refer to two female Rhode Island Reds chickens on to the backs of which white Leghorn skin had been transplanted. After hatching neither of the birds showed any deviations from the normal development

of their breed, the stunted growth (alopecia) could still not be detected a few days after hatching the more so as many Rhode Islands Reds chickens remain normally for some time unfeathered. The development of the plumage in both sexes is usually finished before the end of six months. On the 54th day the birds showed the first signs of an abnormal development. One of them was unusually weak feathered even for a Rhode Island Red. It was only on the transplanted Leghorn skin on the back that the feathers developed normally. Head and neck had an almost normal covering of feathers but all other parts of the body showed pronounced misgrowth in various grades: In some of the defective areas the follicles appeared to be absolutely inactive, while others had sometimes very long, weak, abnormal feathers or short, stumpy feathers, the quill beards grew from the follicles without visible quills. The plucking out of such feathers caused the birds little or no pain. The real cause of this defect is unknown, it has, however many parallels in human alopecia. Other abnormal by-symptons did not appear in these fowls, except a small retardation of the growth and an absence of sociability which lasted till puberty. The birds did not begin to lay until after 8 months as against normally 6—7 months. Such cases of sporadic alopecia are usually ascribed to a endokrine disturbance. The foregoing case contradicts the idea that the transplant of Leghorn skin developes normal feathers. It must therefore be assumed that skin of Rhode Islands and Leghorns are receptive in different ways. The most probable assumption is that it is a question of a new kind of mutation resembling that observed in hairless mammals.

Ascertaining of the standards of birds of single-combed Rhode Island Reds. Adatok az egyszerü taraju rohde-island-red tyuk standardjának megállapitásához. Cs. G. Anghi. Mezögazdasági Közlöny. Heft 12. 1929. Ref. Züchtungskunde, 1931, p. 115.

For the purpose of ascertaining the standards of birds the writer took in total 20 measurements of the bodies of 188 Rhode Island Reds which had been bred in Hungary. The following were the average measurements:

Length of beak 3,31—3,40 cm., height of beak 1,11—1,68 cm., breadth of beak 2,32—2,38 cm., length of comb 4,31—4,57 cm., height of comb 1,35—1,55 cm., length of skull I 3,48—3,58 cm., length of skull II 1,85—1,95 cm. Length of trunk 18,60—18,80 cm., length of back 17,48—18,02 cm., length of breast 10,42—10,78 cm., abdomen length 3,12—3,48 cm., depth of breast 11,89—12,33 cm., depth of pelvis 6,29—6,77 cm., length of shank 9,76—10,14 cm., breadth of cloaca-ring 2,13—2,25 cm.

In his article the writer also makes mention of groups of the variations in body measurements based on the foregoing figures.

Popularity of sex-linked Birds. H. Howes. Farmer and Stock-Breeder, December 1929. (Ref. Züchtungskunde, 1930, p. 238.)

The use of cross-bred birds for egg production is becoming increasingly extensive. Only birds descended from the cocks and hens of breeds noted for their laying capacity should be used as initial material. With this beginning the birds for cross-breeding might surpass both parents in many of their good qualities.

The birds often show a quicker development than pure breeds and it is therefore possible to start hatching later than usual. This has the advantage

that the breed can be used for pure breeding in the first months of the year and in March begin with the cross breeding. The quicker development will be noticed much sooner if cocks of lighter breeds are crossed with hens of heavier breeds. The cross-breed birds of the first generation will surpass the two initial breeds in egg production. It is a great adventage to be able to distinguish the sexes of so bred crosses at an early stage.

Finally a few favourite crosses are mentioned. As very good initial birds, especially for winter egg production Rhode Island Red cocks and light Sussex hens are recommended. Chickens from this cross will begin laying in the 5th month. Another favourite cross is brown Leghorn with Light Sussex.

Starting with pure-bred and sex-linked day-olds. Plan which avoids the trouble and uncertainties of hatching at home — points to watch and some useful crosses. H. Howes. Farmer and Stock-Breeder Vol. 44. 1930.

The advantages obtained by buying one-day chicks instead of breeding them oneself are too well known to need discussing here. The subject however, contains some useful information for undertakings which are started less for breeding than for the egg production. For such it is of importance to be able to distinguish with certainty the cock from the hen chickens as early as possible, as is well known this is possible in F_1 birds of certain cross-breeds. For example:

Brown Leghorn m. with light Sussex f.: chicken: light m., brown f.

Buff Leghorn m. with light Sussex f.: chicken light m., dark f.

Rhode Island m. with light Sussex f.: chicken light m., dark f.

Black Leghorn m. with barred Rock f.: chicken m. black with white head-spot, f. pure black.

In this way the cock-chickens can be eliminated or fattened while the hen-chickens of the breeds mentioned intended for breeding generally make good layers.

Obervations on interspecific hybrids of the fowl. A. S. Serebrovsky. Journal of Genetics, Vol. 21. p. 327—340. 1929. Ref. Züchtungskunde, 1930, p. 547.

During his occasional visits to Germany, the writer examined a number of cross breeds which were put at his disposal by the Museums in Berlin, Hamburg and Hannover and which have already been partly described by Poll. The following crossings are treated:

1. Gallus bankiva and Gallus varius, the two most important kinds of domestic game fowl. 2. Turkey-cock and guinea-fowl. 3. Peacock and guinea-fowl. 4. Ordinary fowl and guinea-fowl. 5. Various domestic fowl and Hybrids of Mongolian-pheasants. 6. Various pheasant crossings.

A more exact analysis of the mixture of age characteristics which appear in these crossbreeds is possible, as owing to the numerous experiments carried out with a most varied number of breeds of domestic poultry, in connection with hereditariness, a large number of gens for the colouring and formation of the plumage have become known. Thus the writer was able to point out the following gens in the crossbreeds even without seeing the parent birds: 1. „Sukli" factor for bare neck. 2. „Todi" factor for dominant white (Leghorn white). 3. „Tifa" factor for black plumage (see Black Minorca). 4. „Trase" factor for single coloured plumage, the allemorph „atrase" limits the recessive feather sprinkling (white tips). 5. „Tuge" silver factor connected with sex. 6. „Trate" factor for dominant white sprinkling. 7 „Tofa" preventative factor for the brown pigment

of the Melaningroup, causes the appearance of yellow. 8. „Susta" factor for feathering of the feet. 9. „Trage" factor connected with sex for barred colouring (Plymouth Rocks).

The genetic analysis of such species and race crosses is naturally of great importance for many reasons. Much more could be done if when preparing the skins the labelling viz. the records had been more complete. This point should be taken into consideration in future.

Gallus Varius a tribal Form of domestic Fowl. Auch Gallus varius eine Stammform des Haushuhnes. B. Grzimek. Can. Med. Vet. Wittenberg. Tierärztliche Rundschau, 1931, p. 269.

Darwin's theory that our fowls are descended from Gallus Bankiva has held good for half a century because nobody took the trouble to investigate the truth of this statement. Domestic animals are only of secondary importance to Zoologists and veterinary science has also pretty well neglected them.

The domestic fowl is one of the youngest domestic animals. The influence of man has changed it but little.

Descendants of a cross between Gallus Varius and a domestic fowl can be seen in Java. This abolishes the theory that domestic fowls are descended only from Gallus Bankiva. The Gallus Varius may also be considered as a tribal form. The undivided wattle of the Gallus Varius disappears already in the first generation after the crossing.

It is now necessary to study G. Lafayette and G. Sonnerati.

Four discolouring characteristics in pigeons. Vier Verblassungskaraktere bei Tauben. Chr. Wriedt and W. W. Christie. Ref. Züchtungskunde, 1929, p. 449.

It is known that a modification of the feather pigment takes place during the course of one or more moults of many breeds of domestic fowls and pigeons. This symptom is known as age-dimorphism, which serves to emphasize that in the form concerned, young and old plumage are to be distinguished.

The writers describe the hereditary state of 4 such types of age dimorphism and call these characteristics „Discoulouring characteristics". Type I is found among Danish Branders; in dominant red, recessive red, black, brown and copper (red with black markings) colours. The discoulourings consist in the replacement of coloured feathers by white ones. From photographs the discoloured young feathers would appear to be multi-coloured. There is hardly any distinction between the nest plumage and the first full-grown plumage. It is only after a later moult that the plumage discolours. Type No. 2 was found by the writers among the striped Norwegian tumblers with black and recessive red. In the blacks the feathers of the back and shield in the nest plumage showed white eggs and in the recessive reds the young feathers are white with coloured tips. This dominant discolouring factor is active before the first or second moult. Type No. III was found among black and dominant red turtle doves. After the first or second moult the coloured young feathers are replaced by white speckled ("frosted") old feathers. Homozygotes were not found amoung the material used. Hereditariness is dominant. Type No. IV was proved to be recessive and only active among dominant and recessive reds. Black pigeons show no discoloration. This factor first appeared in a cross between Norwegian Petentes and Danish Tumblers. Coloured feathers were usually replaced by pure white feathers in the first moult. In English tumblers and the Viennese white shieldtumblers examined by the writer this age dimorphism is confined to certain parts.

Studies on inheritance in pigeons. VII. Inheritance of red and black color patterns in pigeons. W. R. Horlacher. Genetics 15. P. 312—346. 1930. Ref. Züchtungskunde, 1930, p. 546.

One of the characteristics investigated was a black-red pattern of the feathers as these appear in various tumbler-breeds (Brander, Almonds, „Bronze-Tippler". In future it will be called „Milan pattern". Among English speaking breeders this unwelcome peculiarity in pure black feathered breeds is called „Kiteness" (Kite = Milvus ictinus = Red Milan). This is usually found in the flight feathers, 1st row, but also in other parts of the body. The division of the two kinds of pigment in the feathers is also not according to the various structure elements but both kinds of pigment grains appear in one and the same ramus or radius.

The Milan pattern is been ascribed to a dominant g en K, which is only active when the black factor E (Cole 1914) is present. The recessive red pigeons of Cole have the genetic constitution ee: it is possible that they have the K factor but it does not become visible. The dilution factor i, also when factor K is present, changes black in gray and red in yellow, so that the Milan Pattern always appears in black-red and in gray-yellow. According to Lloyd-Jones the blue colouring, the typical pigeon blue, is caused by the clotting of the black pigment. The clotting factor s has no effect on the red pigment. The K factor also appears to be active in the clotting of the black factor, thus in blue colouring, and to create blue-red Milan pattern. The pattern factor A described by Cole and Kelly, for the activity of which the presence of E hypothesis is necessary, appears to be epistatic over K.

The second characteristic investigated was a sort of mottling viz. the two different colouring types spread over various feathers and are also found on some parts of the body. This kind of colour division is found in Archangel pigeons which are sometimes known as Jay pigeons. In bronze jays the head, neck, breast, thighs and under-body including the upper tail feathers are red, wings, back and tall black.

The Archangel mottling is ascribed to a gen p, which is recessive in opposition to single colouring. Other writers (Bessmertnaya, Metzschaar) described the Archangel mottling as dominating. This question and the cause of the characteristic age dimorphism in these pigeons are still somewhat obscure. It appears to be certain, however, that the difference between bronze and gold jays (red, sometimes yellow ground) is not to be attributed to the intensity factor J. The pointed-heads are dominant over the flat-heads in Jay Pigeons.

Porcupine pigeons. Studies on inheritance in pigeons. VIII. L. J. Cole and L. E. Hawkins. Journal of Heredity, 1930, p. 31. Ref. Züchtungskunde, 1930, p. 366.

In 1913 the writers received 3 young peacock-pigeons the plumage of which was strangely formed. There was only one principal shaft for each contour feather which had, however, scarcely any side branches. This type of feather did not change after the moult. All these birds were descended from a normally feathered peacock-pigeon, which altogether had hatched 7 porcupine-pigeons and 4 normal pigeons. In 1927 the writers again received similar material: from a breeder they received 3 carriers which showed almost the same mixed formation of plumage. Cross breeding experiments showed that it is often a case of a recessive characteristic:

PP × pp	gave	7	normal	0	Porcupine	pigeons
Pp × Pp	„	22	„	11	„	„
Pp × PP	„	6	„	0	„	„

Pp × pp	„ 14	„ 10	„	„
pp × pp	„ 0	„ 2	„	„

One of the birds showed a nervous defect which, however, had no connection with the formation of the plumage.

History of Carrier-Pigeons. Zur Geschichte der Brieftaube. P. Martell. Münchener Tierärztliche Wochenschrift, 1931, p. 18.

The history of carrier pigeons from the earliest up to the present.

Causes of Sterility in Pigeons. Recherches sur les Causes de la Stérilité, conséquence de la Consanguinité chez le Pigeon domestique. R. Lienhart. Comptes rendus de la Société de Biologie, 1930, p. 595.

Pairing of brothers and sisters must be avoided but pairing of fathers and daughters or grand-daughters, mothers with sons or grandsons not lead to sterility.

Growth of Pigeons. La Croissance du Pigeon domestique. R. Lienhart. Comptes rendus de la Société de Biologie, 1931, Tome 107, p. 47.

Very few tests have been carried out in connection with the growth of pigeons. The writer made tests with ordinary pigeons which at maturity weighed 550—575 grams.

The egg weighs 20—23 grams. When hatched, after 18 days sitting, the pigeon weighs 18—20 grams and the remains of the shell weigh 1,5 grams. The pigeon gains 10 grams in weight during the first 24 hours and a further 10 in the 2nd 24 hours. On the third and fourth days it gains 20 grams. From the 5th to the 11th day it gains 30 grams per day, on the 12th day 35 grams, and the 13th day 40 grams. On the 14th day the pigeon gains 25 grams and on the 15th and 16th days only 10 grams. On the 17th, 18th, 19th and 20th days only 5 grams per day.

From the 20th day the weight ceases to increase and at three months the pigeon is fully grown. A young pigeon grows wonderfully quick increasing in 20 days from 20 to 435 grams. In order to attain this only 600 grams of food were given.

DISEASES

INFECTIOUS DISEASES

THE CAUSE OF CORYZA.

The cause of Coryza. Een haemoglobinophile Bacterie als oorzaak van Coryza Infectiosa Gallinarium. Prof. Dr. L. de Blieck, Utrecht. Tijdschrift van Diergeneeskunde, 1931, p. 310.

Prof. de Blieck has separated Coryza from Fowlpox-Diphtheria by infecting birds which were immunized against fowlpox. He succeeded to infect birds in series with pure coryza. Filtration experiments had always a negative result, a filterable virus as the cause of coryza could not be found. From a case of pure coryza the author isolated a bacillus, which could be classified as a bacterium of the „influenza group".

With subcultures in 8 passages 17 fowls could be infected, which shew the typical coryza symptoms. It was also possible to infect other birds from these with culture infected fowls.

With other bacteria species, cultivated from coryza cases, the results regarding experimental infection, were always negativ.

PULLORUM.

Comparison of the Efficiency of the simplified Method of Bunyea, Hall and Dorset and the Standard Tube Test for the Identification of Carriers of Pullorum Disease. Wm. L. Bleecker, University, Fayetteville, Arkansas. Journal of the Am. Vet. Med. Association, 1931, p. 518.

Conclusions:

It is concluded that in the hands of an experienced operator if from three to five minutes be allowed before a diagnosis is made, the simplified agglutination test for the detection of carriers of pullorum disease infection is fully as efficient as the tube test. It has a number of advantages over the tube test.

1. It is entirely applicable to field use.
2. Only one drop of blood is required, so it has no bad effect on the fowl.
3. Testing can be done at any time during the year.

4. Very little glassware is required.
5. Cloudy precipitates do not interfer.
6. It is so easily applied that repeated tests can be made; making it possible to rid the flock entirely of carriers in the least possible time .
   It was found that leg-bands could not be dispensed with.

Pullorum Disease. Hubert Bunyea. Bureau of Animal Industry. Washington, D.C. Journal of the Am. Vet. Med. Association, 1931, p. 430.

Recommendations:

In summarizing this report, your committee desires to make the following special recommendations:

1. That the various state laboratories or other functioning agencies be and are hereby urged to extend their facilities to the widest possible application of the available diagnostic test methods for the detection and control of pullorum disease.
2. That such agencies use their influence to have poultrymen adhere to the practice of prompt disposal of reactors and through disinfection of premises following, the application of tests for pullorum disease.
3. That veterinarians and state live stock, sanitary officials be and are hereby urged to educate poultrymen and hatcherymen by securing their attendance at and adressing them in public gatherings, by supplying them with suitable printed information in the form of popular bulletins, public notices, and so forth dealing with the control of pullorum disease, and by visiting their poultry plants and giving such verbal advice as the circumstances seem to warrant, warning them of the necessity of obtaining baby chicks and eggs for hatching from reputable sources, also of the danger in introducing untested fowls (male or female) into their breeding flocks, and instructing them in the effective disinfection of premises which have been infected by pullorum diseased stock.
4. That this body favor the institution of three or more judiciously located annual sectional conferences of workers in pullorum disease control, similar to that known as the Eastern States Conference of Laboratory Workers in Pullorum Disease Control for the purpose of coördinating and standardizing, as far as possible the laboratory and regulatory practices in the diagnoses and control of this disease, with the further tentative proposal of a triennial national conference of workers in pullorum disease control, at which all sectional organizations shall come together for a mutual interchange of findings.

Factors connected with Testing for B.W.D. H. P. Hamilton. The National Utility, Poultry Society Yearbook, 1931, p. 92.

The causal organism of the disease is not in the blood stream of an affected adult bird. Many breeders prefer to take the blood at night in the case light breeds, in order not to disturb the birds unduly. It is possible that pullets coming on to lay may suffer materially from the blood collection unless due caution be taken not to frighten them. The test should be deferred until the birds are either in lay or on the point of laying. Control experiments prove that a bird may show a negative reaction before the ovary has become active and positive after maturity has been reached.

It has now been definitely proved that adult birds can infect other adults.

The money spent on one test is completely wasted if over 5 per cent

of the samples submitted show positive reactions and the negative birds are not re-tested. Some authorities advocate an interval of one month between the tests, but I am inclined to think that this is too long. I advise re-testing all the negatives in 14—18 days after the removal of the positives and if a complete absence of the disease is aimed at for the ensuing season repeated tests on houses where any reactors are found should be undertaken at the interval advised. The first test is only to be regarded as a feeler and the number of subsequent tests depends solely on the result of the first test.

Combatting Pullorum-Disease. Die Bekämpfung der Pullorumseuche des Geflügels. Prof. Dr. H. Mieszner, Hannover. Deutsche Landwirtschaftliche Geflügelzeitung, 1931, p. 677.

During the last year the writer examined more than 10.000 hens. Pullorum is combatted by the rapid blood test indicated by Mieszner and Berge in Hannover and Wagner in Berlin. This method has been repeatedly controlled and found reliable. In the slow method a dilution of 1 in 100 must be applied as a dilution of 1 in 25, which is often taken, has been found to be unreliable.

Laymen are strongly advised not to administer injections of diphtheria vaccin. This is forbidden by law in Prussia.

The Transmission of Pullorum Disease among adult Stock. G. H. Warrack and T. Dalling, Langley Court, Beckenham, Kent. Veterinary Journal, 1931, p. 24.

Summary:

1. Transmission of pullorum disease takes place in adult stock between reactors and non-reactors.
2. The smaller the space in which fowls are penned the greater is the chance of such transmission taking place.

Experiments with Pullorum. Prozentuale Beteiligung der Organe geschlüpfter und ungeschlüpfter Küken an der Infektion mit bakterieller Kükenruhr. Dr. H. Firnstein, Hygienisches Institut, Tierärztliche Hochschule, Berlin. Tierärztliche Rundschau, 1931, p. 305.

Conclusions:

1. In percentages the organs were infected as to follows: liver 100 %, hart 97,5 %, bone-marrow 93,8 %, spleen 89,6 %, lungs 77,2 %, kidneys 71,6 %, yolks 67,9 %, muscles 65,1; sexual-glands 56,0; intestines 30,1 %, proventuculus 33,1 %, brains 19,3 %, gizzard 18,8 %, cloaca 11,2 %.
2. The percentage of gross-lesions was: hart 45,5 %, spleen 27,3 %, liver 14,5 %, lungs 6,0 %.
3. Percentage of sexes: male 45,4 %, female 54,6 %.
4. In embryos no organs were infected, only the yolks.
5. Of the eggs 1,53 % were infected.
6. The liver is the worst infected organ and the most suitable for preparing cultures.

Pullorum Disease in Rumania. Sur la diarrhée blanche bacillaire des poussins à Bacillus pullorum Rettger en Roumanie. C. Cernaianu and S. Popovici. Jassy. Comptes Rendues de la Société de Biologie, T. 105, p. 84.

For the first time the writers have discovered that pullorum disease also occurs in Rumania. There are two strains of B. pullorum. One ferments arabinose in 5—15 days and forms gas in glucose, the other does not form gas in glucose and ferments arabinose in 24 hours.

Bacillosis gallinarum and Coccidiosis in Estonia. Gallinarumbatsilloosi ja Kanade Koktsidioosi esinemisest Eestis. E. Roots and O. Einer. Estnische Tierärztliche Rundschau, 1930, p. 158.

Sporadical cases have been found in Estonia but there was no epedemic. The disease is described according to the material investigated. The disease was transmitted by imported poultry and eggs. The coccidiosis has probably been present in the country a long time.

Bacillus Gallinarum. Gallinaarum Batsilloosist. G. Tehver. Estnische Tierärztliche Rundschau, 1930, p. 56.

Detailed discussion based on a review of literature. (Ref. Tierärztliche Rundschau, 1931, p. 273.)

TUBERCULOSIS.

Remarks on Avian Tuberculous Infection in Mammals. L. van Es. University, Lincoln, Nebr. Journal of the Am. Vet. Med. Association, 1931, p. 371.

Material from 105 domestic birds yielded a purely avian strain of B. tuberculosis in 104 of the cases. In the remaining case the avian bacillus was accompanied by a bacillus of mammalian origin.

The final results with the material derived from the 227 cases of human tuberculosis largely non-pulmonary, revealed that in 217 of them the human strain was identified in the lesions, in 9 cases the bovine tubercle bacillus was present, in none of the lesions examined was the presence of avian bacillary infection even suggested by the typing evidence obtained.

Avian sources of tuberculosis play an important part in the etiology of the disease in swine and in a certain type of tuberculous disease in cattle, the avian bacillary strain is also a causative factor in a conspicious number of the cases examined.

Dr. E. L. Stubbs stated that the avian bacilli infect horses. Dr. Feldman showed that the avion organism, even after passing through the intestinal tract of the dog, was still virulent. The avian bacillus will remain alive in the soil for a long time and still be capable of producing tuberculosis. Rats and mice will spread this disease among chickens. Dr. Plum in Denmark reported several cases of abortion in cattle which he attributed to the avian bacillus.

Fowltuberculosis-Bacilli in Swine. Dr. A. Clarenburg, Utrecht. Tijdschrift voor Diergeneeskunde, 1931, p. 345.

In the spleen and kidneys of a pig a peculiar form of tuberculosis was observed, due to avian tubercle bacilli. The spleen was greatly enlarged and showed a great number of greyish white irregular foci, while the kidneys contained sarcomlike neoplasma. Histologically a diffuse inflammation was established and giant cells were encoutered. Neither typical tubercles nor retrogressive changes (caseation and calcification) were found.

Tuberculosis. A. Study of Avian Tuberculosis in Cattle. N. Plum. The Cornell Veterinarian, T. 21, p. 68.

Infection of cattle with avian tuberculosis causes reaction with bovine tuberculosis. It was only in the mesenterial glands that tuberculosis lesions were found. When cattle had been infected for a lengthy period with avian tuberculosis the tuberculin reaction turned out negative.

Avian Tuberculosis. A. F. Schalk, State University, Columbus, Ohio. Journal Am. Vet. Med. Association, 1930, p. 437.

Baby chicks are not hatched with tuberculosis from eggs from tuberculous hens, less than 1 per cent of eggs from tuberculous hens contain tuberculosis organisms. An overwhelming majority of localised tuberculous foci in swine are the result of the avian type of the germ.

The avian organisms may remain viable and capable of reproducing the disease after having harbored for two years in ordinary barnyard soil. Pigeons, sparrows and common rats are definite mechanical carrier hosts of avian tuberculosis. Cattle do occasionally contract the avian type of the disease, though usually in a slight and localized form.

Studies in the Epizootiology of Avian Tuberculosis. D. C. Matheson. The Royal Veterinary College, Edinburgh. The Veterinary Journal, 1931, p. 36.

Tuberculosis is not a seasonal disease, the finer months of the year show a notable proportion of cases, even June is not exempt.

Experiments with Fowl Tuberculosis. Thorp. The North American Veterinarian, Dec. 1930.

Eggs infected with tubercle bacilli appeared to be less suitable for hatching than normal eggs. The majority of the chickens hatched from the infected eggs were suffering from tuberculosis.

Fowl Tuberculosis. Lindu de tüsikusest. G. Thever. Estnische Tierärtliche Rundschau, 1930, p. 124.

Lecture on tuberculosis and its treatment according to the most recent literature (Ref. Tierärztliche Rundschau 1931, p. 274).

DIPHTHERIA.

Fowl Pox Vaccine. The Journal of the Ministry of Agriculture, March. London, 1931.

The Ministry wishes to notify poultry farmers that it is now issuing a vaccine for Fowl Pox (avian diphtheria; diphtheritic roup; canker) at a charge of 1d. (one penny) per dose, to cover the cost of production. There will be a minimum charge of 2s. 6d. (two shillings and sixpence), this sum covering the supply of 30 doses of the vaccine and an instrument and brush for its application.

The vaccine has been extensively tested in the field during the past 15 months; during that period, some hundreds of thousands of fowls have been inoculated, with very satisfactory results. The vaccine confers a solid immunity of at least four months' duration; it is free from danger; it causes no constitutional disturbance; and it does not interfere with egg production.

In order to keep down the cost of production and avoid unnecessary clerical work, **cash must be enclosed with each order.** Orders should be addressed to The Director, Ministry of Agriculture and Fisheries, Veterinary Laboratory, New Haw, Weybridge, Surrey. Cheques, money orders and postal orders should be made payable to „The Ministry of Agriculture and Fisheries" and crossed „Bank of England".

Vaccinate against Fowl Pox. Progress Report of the 7th Alabama National Egg Laying Demonstration, April, 1931. Auburn, Alabama.

Every year, poultrymen suffer severe losses both of birds and egg production as a result of fowl pox. By vaccinating when the pullets are from three to five months of age, a large portion of this loss may be saved. It takes very little time and expense to vaccinate and any poultryman can give the virus. County Agents and Poultry Specialists will be giving demonstrations at various points over each county of Alabama and we urge you to attend especially if you are not familiar with the use of this virus. Many other states are working on a similar plan and some states have almost eliminated the loss from fowl pox by vaccinating last year.

There is a very interesting example of the results of vaccinating in the present contest. Eight pens that were vaccinated were in houses with eight pens that were not vaccinated and almost every bird in the pens that had not been vaccinated had pox. None of the vaccinated birds had it. The pens that had pox lost approximately one month from production besides a heavier loss from mortality for the entire year. There were other houses that had two pens that had been vaccinated and had no pox. From the above facts, there is no better life insurance on good pullets than vaccinating, using the „stick method", as is recommended in circular 126, Poultry Department, Auburn, Ala. If you are not familiar with the application of the „stick method", write for this circular and insure your birds against fowl pox.

Fowl-Pox. Weitere Untersuchungen über Geflügelpocken. K. Bierbaum. E. Eberbeck, K. Rasch, W. Kayser. Institut für Tierseuchentherapie der Tierärztlichen Hochschule, Berlin. Zeitschrift für Infektionskrankheiten, 1931, p. 141.

The results of the tests made by Saits, Zwick, Seifried, Schaaf and de

Blieck, who stated that fowl-virus could be applied to pigeons through pigeon-passage, were confirmed.

Mixed virus can again be divided into the two components by one-sided passage through hen or pigeon. Mixed virus can occur under natural proportions in pox of hens.

It has still to be proved in practice that the results with fowl-virus, which has been passed by pigeons, are better than with pigeon-virus.

Plurality of the fowl-pox-virus could not be shown in the four tribes examined.

Comparisons between Fowl-Pox-Virus and Pigeon-Virus. Ruggerini and Cilli. La Nuova Veterinaria, 15 Nov. 1930. (Ref. Recueil de Méd. Vétérinaire, 1931, p. 237.

In a case of sickness among pigeons the virus was found in the blood, liver, brains and bone-marrow. Neither pox nor stomatitis vesicularis could be caused with this in horses.

Relationship between Variola-Vaccine and Fowl-Pox-Virus. Immunitätsbeziehungen zwischen Variolavakzine und Geflügelpocken beim Huhn. Dr. J. Fortner. Zeitschrift für Infektionskrankheiten, 1931, p. 150.

Conclusions:

1. It was not possible to protect the hen against artificial fowl-pox by variola vaccination.
2. The fact that fowl-pox has been endured is not proof of protection against variola-infection.
3. An infection with variola-vaccine offers but little resistance to a later infection.
4. If fowl-pox has been endured an almost absolute immunity against a further attack of fowl-pox is the result.

A Comparison of the Inclusion Bodies of Fowl-Pox and Molluscum Contagiosum. E. W. Goodpasture and C. E. Woodruff. Journal of the Am. Vet. Med. Association, 1931, p. 717.

The inclusion bodies of molluscum contagium may be freed from surrounding cellular material by tryptic digestion. Unlike fowl-pox inclusions, they are found to be sticky and gelatinous after they have been digested. The gelatinous matrix has a markedly granular appearance due to the presence within it of myriods of Lipshütz granules. These granules are identical with the Borrel bodies of fowl-pox. They are resistant to the action of trypsin. The molluscum bodies show little or no swelling in distilled water, fowl-pox inclusions swell markedly. Trituration readily breaks up moluscum inclusions while fowl-pox inclusions fail to break so readily. Cross-inoculation experiments on fowls and man have proved unsuccessful.

Fowl Pox Virus Transmission by Mosquitos. Sur la transmission de l'épithélioma contagieux par les moustiques. G. M. de Oliveira Castro. Sao Paulo. Comptes rendues de la Société de Biologie, T. 105, p. 316.

Fowl-pox-virus was transmitted by the blood that mosquitos (Culex quinque fasciatus Say) had sucked from infected hens. The infection was not due solely to the bite of the mosquitos as the faeces also appeared to be infectious.

FOWL PEST

A Study on Madras Fowl Pest. K. Kylasamaier, Madras Veterinary College Laboratory, Indian Veterinary Journal, 1931, p. 340.

Summary:

The virus of the disease is ultra-microscopic. Culture tubes inoculated with virulent materials have remained sterile, nor could any specific organisms be demonstrated in the blood or other tissues of affected birds. The period of incubation as observed varied from 24 hours to 5 days, exceptionally over 5 days. From the tests made so far, it has been found that besides the saliva, alimentary contents and heart blood, the tissues such as liver, spleen and brain are highly infective. Liver and spleen and possibly brain tissue appear to be suitable material for vaccine.

The results of cross tests with rinderpest virus would seem to suggest a relationship between rinderpest and the pest among fowls. As regards immunity following vaccination, it is premature to say how long the immunity lasts. It would appear that at least 3 days must elapse after vaccination for birds to resist the infection.

Owing to the widespread outbreak of this disease in the city and in the districts, it was rather difficult to secure healthy fowls for experimental purposes, but all possible precautions were however taken in selecting the birds for the experiment. These were kept under observation whenever possible.

Further work on this disease is in contemplation.

An atypical Fowl-Plaque Virus from Egypt. H. S. Purchase. Ministry of Agriculture Laboratories, Weybridge. Journal of Comparative Pathology, 1931, p. 71.

Conclusions:

The following conclusions have been drawn from the experimental work reported in this paper.

I. The Egyptian virus is distinct from that causing Newcastle disease in England, pseudo fowlpest in the Dutch East Indies, and a similar disease in the Philippine Islands. The results of work carried out in this laboratory and in the Philippine Islands have shown, that these are one and the same virus.

a. Symptoms. Fowls affected with the Egyptian disease never present any excessive salivation or the subdued croaking often encountered in Newcastle disease.

b. Pathogenicity. The Egyptian virus is not pathogenic for pigeons.

c. Immunologically. The Egyptian virus is distinct from Newcastle virus.

d. Contact experiments were successful in only 25 per cent of the twelve pairs tested. From personal observations made on a number of occasions, when using the Newcastle virus a contact has never been known to escape infection.

II. The Egyptian virus may be said to differ from ordinary fowl plague in the following two ways:

a. The period of incubation, which in the Egyptian disease is over four days, is more than twice that of ordinary fowl plague.

b. The infectivity of the blood is low, the highest M.L.D. being 0.001 c.c., whilst in fowl plague a M.L.D. of 0.00001 c.c. is common and in some cases a millionth of c.c. or less is infective.

III. That this disease is in reality a form of fowl plague, although running a slower course and showing the virus in less concentration in the blood, is the obvious conclusion after noting the following important points of similarity.

a. Immunologically it has been tested against a number of fowl plague viruses and complete protection has always been obtained in the cross immunity tests.

b. Symptoms, when present, differed from those of fowl plague only in being more prolonged.

c. The lesions noted in the Egyptian disease were similar to those found in fowl plague.

d. The results of filtration experiments with the Egyptian virus were very similar to those obtained with fowl plague virus.

e. Contact experiments with the Egyptian virus, revealed that only 25 per cent of the pairs showed transmission, a result which is very similar to that obtained with the fowl plague virus.

Experiments with Egyptian Pest. A Propos des Neuro-Infections auto-stérilisables. E. Lagrange. Comptes rendus de la Société de Biologie, 1929, Tome I, p. 544.

In pseudo-pest in Egypt the blood, brains and faeces are usually virulent. The writer obtained good results from injections with diluted brain-virus. In vaccinated birds which died slowly the blood and the brains are virulent but the liver not.

In other cases the writer discovered that the brains and blood were not virulent. This points to the sympton of auto-sterilization described by Levaditti: (Levaditti, Sanchis-Bayarri and Schoen call cases in which birds die from nerve infections and in which nerves show histological lesions but contain in no virus, „neuro-infections mortelles auto-sterilisables".) Lagrange discovered that auto-sterilized brains caused immunity when injected. It is possible that anatoxine is formed which is not virulent but which, however, works protectively.

Regarding autosterilisable Neuro-Infections. Local Auto-Sterilizations. A propos des Neuro-Infections autostérilisables. Les Autostérilisations locales. Ib. 1929, Tome III, p. 278.

The writer discovered that in hens which had died of pest various organs did not contain virus (Lungs, brains, spleen).

Mortal Auto-Sterilization of Avian Egyptian Pest is an Epidemical Phenomonem. L'Autostérilisation mortelle de la Peste aviaire d'Egypte est un phénomène épidémique. Ib. 1931. T. 106, p. 1081.

Egyptian pest occurs chiefly between December and June. The disease vanished of itself in June 1929 while the virus of test-hens appeared to be fatal. In December 1929 the disease appeared again and raged until September 1930. In October 1930 is disappeared again.

In 1928 and 1929 cases of auto-sterilization were discovered. In December 1930 various cases were discovered with typical disease symptoms and avirulent brains. In 1931 many cases were also found with avirulent brains.

Effect of Electric Current on Fowl-Pest-Virus. Action de la Cataphorèse sur le Virus de la Peste Aviaire. P. Lépine. Comptes rendus de la Société de Biologie, 1930, p. 285.

Under the influence of electric current and in the apparatus described by Lépine the virus of fowl-pest deviates to the anode and only to this pole of the apparatus.

INFECTIOUS LARYNGOTRACHEITIS

A filtrable Virus-like Agent in Avian Laryngotracheitis. R. Graham, F. Thorp, W. A. James, University, Urbana, Illinois. Journal of the Am. Vet. Med. Association, 1931, p. 506.

Summary:

1. Bacteriologically sterile filtrates prepared from composite laryngeal exudates and body tissues of naturally infected fowls in two separate outbreaks of laryngotracheitis inconsistently produced subacute inflammatory changes in the larynx of healthy fowls.
   The infective nature of the filtrate-induced disease was demonstrated by repeated transfer to healthy fowls.
2. The acute type of laryngo-tracheitis was not induced experimentally by sterile filtrates in intralaryngeal instillation, but symptoms approaching the acute malady were occasionally observed.
   The infective character of the unfiltered inoculum was demonstrated in susceptible fowls. The Mandler filtrates were less infective than the unfiltered inoculum, as judged by symptoms and gross lesions.
3. The bacteriologically sterile filtrable virus-like agent in the laryngeal exudate of subacutely infected fowls remained viable at ice-box temperature for periods of thirty and sixty days.
4. The communicable character of the subacute disease in young chicks to mature fowls was demonstrated by direct laryngeal swabs.

An apparently new Respiratory Disease of Baby Chicks. A. F. Schalk and M. C. Hawn, Agric. College, Fargo, North Dakota. Journal of the Am. Vet. Med. Ass. 1931, p. 413.

This disease was encountered in many states. At least 25000 affected and dead chicks came under author's observation. The disease has assumed the proportions of 1000 sick chicks per square mile in some southern Minnesota counties.

Experiments indicated that authors were dealing with un unusually highly contagius disease, so readily transmissible that control chicks could not be carried in the same building.

Baby chicks proved to be very susceptible for Berkefeld filtrates of the virus.

Gasping is the most noticeable and spectacular symptom, but it is not necessarily the first evidence shown. Many chicks die without manifesting this phenomenon.

In most chicks the changes of laryngotracheitis were entirely absent. The most constant and characteristic lesions were encountered in the lungs and bronchi.

Of the diseased birds the mortality was found to be from about 40 to 90 per cent and sometimes more.

Treatment was succesful with menthol, oil of eucalyptus and guaiacol.

Infectious Laryngotracheitis in Pheasants. George Kernohan, University, Berkeley, California. Journal of the Am. Vet. Med. Ass., 1931, p. 553.

Beach was unable to transmit infectious laryngotracheitis from fowls to pigeons, doves or sparrows.

An outbreak is reported of the disease among fowls and pheasants. Attemps to transmit the disease from pheasants to fowls and pigeons were unsucessful.

LEUCAEMIA

Observations with a new transmissible Strain of the Leucosis of Fowls. J. Furth. Journ. Exp. Med., 1931, p. 243. (Ref. Journ. Am. Vet. Med. Ass. 1931, p. 720.)

Myeloid leucosis and erythroleucosis can be transmitted from one bird to others by emulsions of infiltrated organs, whole blood cells, and plasma. Inoculation is more often successful with blood cells or with whole blood than with plasma or with emulsions of organs infiltrated as a result of leucosis. Inoculation with material from a bird with myeloid or with erythroleucosis produces both myeloid leucosis and erythroleucosis and in many instances mixed forms with characteristics of both. Evidence is wanting that lymphoid leucosis is caused by the agent that transmits myeloid leucosis and erythroleucosis. Injury to cellular structure by treatment with distilled water and by repeated freezing and thawing does not destroy the agent that transmits the disease. Berkefeld filtrates have failed to transmit regularly myeloid leucosis and erythroleucosis. The transmissable agent is filtrable, although there are technical differences in its filtration.

Leucosis. Die Leukose der Hühner. Prof. Dr. H. Mieszner, Dr. R. Berge. Deutsche Landwirtschaftliche Geflügelzeitung, 1931, p. 606.

According to statistics leucosis is becoming more and more frequent. It generally attacks young hens whereas tuberculosis is more often found in older birds.

According to Ellermann and Bang it is caused by a filterable virus. In 100 % of the cases Jarmai was successful in transmitting the disease from one bird to another.

The disease is probably transmitted by infected faeces or skin parasites.

In many cases, but not in all, the blood shows an extravagance of lymphocyts.

Fowl Leucemia. E. L. Stubbs, University of Pennsylvania, Philadelphia. Journal of the Am. Vet. Med. Association, 1931, p. 434.

Since the numerous references to leucemia in the literature are not accompanied by complete descriptions it is difficult to estimate how prevalent or how important leucemia is among fowls.

It has been established that true leucemia exists in fowls and that leucemia can be transmitted by blood injections from affected fowls to healthy fowls.

In author's experiments 52 per cent of injected healthy fowls came down

with leucemia. Two types of leucemia were produced (erythroleucosis and myeloid leucosis).

OTHER INFECTIOUS DISEASES

Avian diphtheritic Enteritis and Swine Fever. J. P. Rice. Ministry of Agriculture, Strandtown, Belfast. Veterinary Journal, 1931, p. 39.

While diphtheric enteritis in poultry is sometimes caused by the virus of fowl pox, an independent sporadic type of unknown actiology seems to exist. Distinct,,button" formation has also been observed by the writer.

In view of the similarity of the lesions to those seen in swine fever, experiments were undertaken to ascertain if there was any relationship between the two conditions.

With material from a case of diphtheritic enteritis received from a laying test a healthy pig was inoculated. This pig died 14 days later. Post-mortem examination revealed haemorrhagic lobar pneumonia, gastro-enteritis and petechiae in the kidneys.

With blood of this pig was inoculated a second pig. This pig also died from swine fever.

With swine fever virus hens were inoculated. One hen died and showed enteritis with marked serous exudation in the body cavity.

Report of Committee of transmissible Diseases of Poultry. Dr. A. F. Schalk, Columbus, Ohio. Journal of the Am. Vet. Med. Association, 1931, p. 445.

In order that the veterinary practitioner may be more able to qualify for, cater to, and make an earnest effort to recover and retain this valuable field of service in the ranks of the profession your comittee herewith submits the following recommendations:

1. That all veterinary colleges immediately project and introduce appropriate courses in poultry hygiene and pathologie as acquired subjects in their academic veterinary curricula.
2. That veterinary colleges hold special poultry conferences, intensive poultry short courses and graduate courses in poultry hygiene and pathology for graduate veterinarians.
3. That in States that have extention veterinarians, poultry hygiene and pathology be made a distinct feature of their extension service to the practising veterinarian.
4. That all veterinary organizations stress poultry hygiene and pathology at their associations meetings.
5. That all state and federal sanitary and regulatory authorities specifically instruct their field agents to spread the gospel of proper hygiene and sanitations to poultry owners whenever the occasion presents itself.
6. That all veterinarians, who are in any way associated with poultry problems avail themselves of all possible opportunities to further their knowledge on poultry hygiene and pathology that they may more adequately prepare and qualify themselves for this very important field of veterinary service with at present is largely in other hands.

There is no doubt whatever, that the disease, which can be called laryngotracheitis or infectious bronchitis or whatever terminology you desire to give it, is at the present time in the Central West and North West the most

important disease affecting baby chicks. The losses occasioned by this disease are in nowise exeeded by those of bacillary white diarrhea. The problem is increasing annually. It is in my belief within the province of the sanitary officers of the various states to take this into very definite cognizance in regard to control measures if they expect to render their full service to the poultry industry.

The Existence of Fowl Typhoid in India. Hugh Cooper and R. N. Naick, Muktesar. Paper presented to Indian Science congress, Nagpur, 1931. Indian Veterinary Journal, 1931, Jan.

In a natural outbreak of disease in a flock of poultry in the Kumaun hills investigation confirmed that it was due to fowl typhoid. It is believed that this disease has not before been reported in India. A point of special interest is the fact that diagnosis clinically between it and fowl cholera is not readily made, and the use of serum or vaccine in outbreaks due to it and believed to be due to fowl cholera may not therefore be followed by satisfactory results. The extent and distribution of fowl typhoid in India must now therefore be investigated. The causal organism, **Salmonella gallinarum** Klein, isolated from dead fowls in the outbreak has been studied comparatively with an English strain of the same organism as well as **Salmonella pullorum** and **Salmonella psittacosis.** The agglutination relationship between these organisms has also been studied. The results are included in the paper.

Attempts to vaccinate healthy birds failed, but since fowls which had passed through an attack of fowl typhoid also died when tested for immunity at the same time, it appears that the virulent culture used for the test was overpowerful. It is probable nevertheless that vaccination against natural infection would give more satisfactory results.

Fowl Paralysis and the „Roup Complex". H. J. Stafseth, State College, East Lansing, Mich. The Journal of the Am. Vet. Association, 1931, p. 423.

Description of Symptoms, Gross lesions, Microscopic Lesions, Cause, Mode of Spread.

Spirochetosis associated with Infectious Bronchitis. M. W. Emmel. Alabama Polytechnic Institute, Auborn, Ala. The Journal of the Am. Vet. Med. Association, 1931, p. 710.

In smears prepared from the exudate and scrapings of the tracheas of birds affected with infectious bronchitis a very large number of spirochetes were found. It appears that the spirochete was merely playing the role of a secondary invader and was not a direct etiological agent.

Bronchospirochaetosis in Fowl. Ueber eine Bronchospirochätose bei Hühnern. Dr. P. Krage and Dr. F. Weisgerber. Bacteriologisches Institut der Landwirtschaftskammer für die Provinz Ostpreuszen, Königsberg i. Pr. Centralblatt für Bacteriologie, Originale, T. 102, p. 60.

Conclusions:

1. In fowls a disease of the upper respiratory tract and of the bronchies occurs similar to the spirochaetosis of human beings. It is typified by a

fibrineous cellular inflammation of the Mucosa of the trachea and the bronches.

2. The cause is a spirochaeta similar to Treponema morsus muris.
3. This spirochaeta also occurs saprophytically in the larynx of healthy hens. It relinquishes its saprophytic qualities as soon as the mucosa becomes inflamed and becomes pathogene.

A Study of Spirochetes in Chickens with special Reference to those in the intestinal Tract. B. K. Minnie Harris. John Hopkins University, Maryland. American Journal of Hygiene, 1930, p. 537. (Ref. Zentralblatt für Bacteriologie, 1931, p. 379).

Three kinds of spirochetes were found in the ceca of fowl in Maryland: 1. Treponema coeci gallorum; 2. Spironema coeci gallorum; 3. Fusi Spirochaeta coeci gallorum.

When fed to chickens all kinds of spirochetes were found to be non-pathogene.

Cultivation of Spirochetes. Culture des Spirochètes de la Poule. E. Marchoux and V. Chorine. Comptes rendus de la Société de Biologie, Tome 106, 1931, p. 1125.

The following are necessary for the cultivation of spirochetae: 1. Albumen of the egg; 2. pepton 0,2 p. 100; 3. glycogene 0.1 p. 100; 4. the temperature must be 37°; 5. the p^H must be 7,5—7,7; 6. the first cultures only result in rabbit-serum; 7. further re-vaccinations also succeed on other serum (horse, ox, man).

The Incidence, Pathogenicity and Transmission of Leucocytozoön Anatis of Ducks. E. C. O'Roke. Jour. Parasitol., 1930, p. 112. (Ref. Journal Am. Vet. Med. Ass., 1931, p. 719.

One hundred and seventy ducks were used in these investigations in Michigan. Ducks transferred from the Biological Station to various lakes showed a high percentage of infestation. Ducklings unprotected by screen and protected from all other insects except Similium venustum became infested. As many of 75 of these flies fully gorged with blood have been removed from a single duckling. Parasites appeared in the blood of ducks 12 days after they had been exposed to the bites of flies. Oökinetes were found in the flies after they had fed upon infected ducklings. Leucocytozoön anatis is apparently not harmful to adult ducks. It is pathogenic for ducklings, the mortality being 35 per cent in the cases studied.

Cellular Imminity in acquired Avian Malaria. Talliaferro, W. H. and L. G. American Journal of Pathology, T. 6, p. 592.

Authors had found that canaries may possess immunity to superinfection with Plasmodium cathemerium, and that it is not due to the presence of antibodies contained in the seum. They now describe the results of a study of the cellular reactions which occur in the course of the development of immunity.

After injection with parasitised bloodcells many parasites escape destruction, sporulate and lead to a crisis about eight days later. After this point, phagocytosis evidently increases and the parasites are overcome. If birds which

have passed through such a reaction are given a second injection of plasmodium-containing blood cells, the phagocytic response is much greater than in the first instance and the invaders are all removed from the blood.

The spleen appears to take a leading part in the production of phagocytes and the liver shares in this action, but to a smaller extent.

The Blood Chemistry of Hens bearing Rous Sarcoma no. 1. J. H. Roe and H. M. Dyer. Abst. Arch. Path., 1931, p. 160. (Ref. Journal Am. Vet. Med. Ass., 1931, p. 719.

Twelve hens bearing Rous sarcoma no. 1 showed no change in the non-protein nitrogen, uric acid, creatinine, chlorids, cholesterol, serum calcium and inorganic phosphorus hemoglobin and bilirubin of the blood. The blood sugar of the sarcomatous hens was found to be elevated There was a questionable lowering of the carbon dioxid-combining power of the blood of the tumor-bearing birds.

Changes in the Blood in Sarcoma. Untersuchungen über die Blutveränderungen beim Rous-Sarkom der Hühner. M. Sadi. Inaug. Dissertation, Berlin, 1930. (Ref. Deutsche Tierärtliche Wochenschrift, 1930, p. 269.)

The blood changes by cancer in human beings, mice and rats show great similarity. Anaemia usually occurs. In sarcoma in hens and human beings the anaemia is not so intense as in carcinoma. In all cases polychromatophilia is prevalent. Leucocytosis is present. In many cases lymphopenia is discovered. In sarcoma of fowl the monocytosis is very clear as also the decrease of the eosinophile cells and the increase of the neutrophile leucocyts.

All these symptons might be lacking in small tumors.

Swine-Erysipelas-bacilli in Birds. Rotlauferkrankungen bei Vögeln im Anschlus an Schweinerotlauf und Mäuseseptikämie. Fritz Schmidt-Hoensdorf, Halle. Deutsche Tierärztliche Wochenschrift, 1931, p. 196.

Already in 1905 Erypsipelas bacilli were found in turkeys, hens, ducks and pigeons and in parrots and other Zoo birds.

In one case the writer discovered the disease in hens on a farm which was extensively infected with Swine Erysipelas.

The second case concerned birds in the Zoological gardens at Halle which had been fed with mice. A disease was prevalent among the mice which was caused by swine erysipelas bacilli and in some of the birds that had eaten the sick mice the bacilli were found after death.

Infectious Cloacitis in Fowl. Infektiöse Cloacitis bei Hühnern. Dr. T. van Heelsbergen. Universität, Utrecht. Deutsche Tierärztliche Wochenschrift, 1931, p. 274.

Conclusions:

The cock plays the most important role in the transmission of this disease. Investigators are still ignorant of the cause of the disease. The cock can be a virus-carrier for a long time.

Typhlohepatitis enzootica in Turkeys. Stjepan Plasaj: Jugoslovenski Veterinarski Glasnik, 1930, p. 332.

Report concerning the occurrence of this disease in Jugosloavia.

Microorganisms in the Intestine of Turkeys. Aero bni mikroorganizmi u crevu zdravik pura. Josip Kucel. Tierärztliche Fakultät der Universität Zagreb. Deutsche Tierärztliche Wochenschrift, 1931, p. 202.

The following were found in the intestines of 25 healthy turkeys: Bacterium Coli, Escherichia acidi lactia and Streptococcus feacalis. In the direction of the rectum are more bacteria than in the direction of the duodenum.

The number of bacteria in fattened turkeys is considerably higher.

The Use of Chinosol in the Preparation of Antigen. Ueber die Verwendung von Chinosol bei der Antigenherstellung. G. Fleischhauer. Zentralblatt für Bakteriologie, Originale, T. 115, p. 480.

Author studied the preserving properties of chinosol and found that it was suitable for the preservation of antigen and that its use did not interfere with the complement fixation reaction.

PARASITES

Helminth Parasites of Poultry. Thomas W. M. Cameron. University of Edinburgh. The Veterinary Journal, 1931, p. 7.

Description of: The Eye Worm, The Gape Worm, The Trematodes, The Tapeworms, The Intestinal Round-Worm, The Caecal Worm.

It is a mistake to think that parasites are important only when they cause death and obvious disease. Their greatest importance usually is the almost imperceptible drain on the strength of the bird with a reduction in vitality, egg production, condition and so on. They are a major accessory cause in many protozoal and bacterial diseases.

The Use of Nicotin and its Compounds for the Control of Poultry Parasites. Cliff D. Carpenter. Petaluma Laboratories, Los Angeles, California. Journal of the Am. Vet. Med. Association, 1931, 651.

In 1910 Arnold developed a 40 per cent solution of sulfate of nicotin and this product has been available principally in the form of „Black Leaf 40". With the evidence of nicotin controlling external and internal parasites in sheep and cattle, Beach and Herms, in 1916, first employed tobacco stems for the control of poultry parasites. During the period from 1916 to 1923 many products were offered on the market, using nicotin sulfate as a base, sold under trade names and were no more efficient than steeped tobacco stems.

In 1924 Freeborn developed the first individual treatment for the elimination of roundworms, using nicotin sulfate as the active ingredient. Linsteadt succesfully combined nicotin and casein and 10 per cent soap and

produced a pellet, called Nicocides. Writer had good results with this product.

Writer describes further the advantages of the paint method with Black Leaf 40 against lice.

The advantages are: 1. No loss of egg-production, 2. No handling of birds; 3. Roost space for one thousand can be treated in one hour. 4. Meat is not flavored nor feathers stained, 5. Supplies are usually conveniently available.

Ticks causing serious Disease in Geese. Ueber eine durch Zeckenbefall hervorgerufene Erkrankung bei Junggänsen. Prof. Dr. Knuth and Dr. Silvia von Bornstedt.

This disease has caused serious damage among geese on the Lausberger Heide (Lausberger Moors) for many years. It also occurs in other districts in Germany.

It is only young geese which still have their down feathers that are attacked and this takes place in the months May to July. It is caused by ticks which clamp themselves fast on thinly featherd places (round the eyes) and cause harm by a toxin secretion or local irritation. Intense infection causes paralysis and disturbances in growth.

In the initial stage a swelling of the eye rims is observable accompanied by increased flow of tears. Later the swelling extends to the root of the beack and the head gets an ugly appearance. The scratching of the birds causes wounds and crusts, the eye lids become stuck and conjunctivitis arises. A discharge from the nose is also often caused. Appetite disappears and growth is hindered.

The feet often swell which causes a waddling gait. There is often diarrhoea and intense thirst. Death often takes place after a few days.

Chino-vaseline applied to the eye rims can be used as a cure. The ticks should be removed very carefully every evening.

Resistance of Chickens to Parasitism affected by Vitamin A. J. A. Ackert, M. F. Mc. Ilvane and Naomie Zimmerman. American Journal of Hygiene, 1931, p. 320.

In 6 tests 187 chickens from 4—8 weeks of age were used to ascertain if resistance to Ascarida lineata was affected by Vitamin A in the diet. Cod-liver oil was the source of Vitamin A. The birds fed Vitamin-A deficient diets showed a characteristic avitaminosis. They showed less resistance to parasitism than those fed cod liver oil. A deficient diet makes it much easier for the young worms to withstand the rigors of peristalsis.

Resistance of Chickens to Parasitism affected with Vitamin B. J. E. Ackert and L. C. Wolf. American Journal of Hygiene, 1931, p. 337.

Experiments with 225 chicks were carried out to ascetain if the Vitamin B complex is a factor in the resistance of chickens to Ascaride lineata. Group of chicks given the same number of embryonated eggs of the worm had more worms when their diet lacked Vitamin B than did similar groups of chickens whose rations contained adequate amounts of this vitamin. Larger worms were found in those chickens whose diet contained yeast than in the groups whose rations lacked it. It is suggested that the yeast may contain a factor which is favorable to the growth of worms.

Worms in Hen. Ascarida lineata (Schneider, 1866), der häufigste Spulwurm der Hühner. Dr. C. Sprehn, Leipzig. Berliner Tierärztliche Wochenschrift, 1931, p. 229.

The writer refers to literary data and describes the differences between A. perspicillum and A. lineata. In 2000 tests he found only A. lineata, never A. perspicillum. A. lineata has also been discovered in poultry in Asia, Africa, North and South-Africa and in the Philippines. This was formerly taken to be A. perspicillum A. lineata is the chief worm in hens all over the world.

Worms in Hen. Heterakis (Ascaridia) perspicillum (inflexa Rud. 1803) oder Het. (Asc.) lineata Schneider 1866. Wilh. Otte, Mitau, Lettvia. Berliner Tierärztliche Wochenschrift, 1931, p. 229.

The writer disputes the statement of Dr. C. Sprehn that the Het. perspicillum cannot be found in Germany and that it is only the Het. lineata Schneider that is found. The writer refers to the publications by Prof. Skrjabin of Moscow. Schneider found the parasite in a kind of wild hen in Brazil and not in the domestic hen. In Europe the Het. lineata has only been found in ducks.

It would be strange if this parasite, which occurs in Eastern Europe, could not be found in Germany.

Turkey Rearing in Confinement for the Control of Blackhead. C. H. Weaver. Department of Agriculture, Ottawa, Canada. Veterinary Report, 1930, p. 50.

During recent years there has been considerable change in the geographical distribution of turkey raising in Canada on account of the ravages of „blackhead" and it has been impossible to carry on anything more than small scale operations after the disease has obtained a hold in a locality.

The author attempted to rear turkeys in close proximity to a poultry „plant" known to be badly infested with intestinal parasites. This point is important because of the association of the „blackhead" Amoeba with the Heterakis in the caeca and the knowledge that caeca worms are very easily carried about by human agencies. Accordingly, the scheme adopted was based on the prevention of avenues of infection between the source (poultry „plant") and the young turkeys during brooding and rearing. The nutritional requirements of turkeys are more varied than those of fowls so that, unless this are given full consideration measures taken to prevent one disease may lead to the production of others which may be more serious. The habits of turkeys cause certain difficulties when attempts are made to rear them in confinement and to feed them out of hoppers: birds with fall behind the rest of the flock in vitality are crowded out by the others. The author's scheme depended upon confining the stock and moving it periodically in portable gards.

One hundred eggs were purchased in a market, and incubated artificially; 43 were hatched and were placed in battery brooders. Green food was purposely withheld as long as possible owing to the danger of parasitic contamination and 18 days after hatching, some of the chicks suddenly showed evidence of vitamine B deficiency; admission to direct sunlight and the addition of green feed did not altogether prevent the development of the trouble in other chicks.

On the 41st day the 31 surviving chicks were put in outdoor coops

with covered runs (6 ft. by 12 ft.) and placed on grass with clover, and the coops were shifted every two days as the grass got eaten down.

By the 61st day the pens were to small for the stock, and it was suffering from a shortage of green feed. It was accordingly moved to current year's sown mixed clover on an area 24 ft. by 48 ft. with an adjoining house which had been carefully cleaned. By the 73rd day all the clover was eaten; the stock was moved to a similar new yard, and after this no other moves were possible. Later some birds flow out of the run; and flight feathers had to be cut.

Of twelve birds that died half were chick losses. Of the remaining six which died or were killed, two had definite lesions and there was possibly evidence of „blackhead" in two others the other two deaths were due to faultty nutrition. The birds which were affected with blackhead showed very slight lesions in comparison with what is seen in ordinary outbreaks. At the 199th day 19 of the turkeys were killed and examined in great detail. The average weight was 15.1 lb.

The internal organs of all the birds were normal; the intestines were free from worms, and there were no indications of nutritional deficiency disease.

COCCIDIOSIS.

Iodine in the Control and Treatment of Avian Coccidiosis. W. R. Kerr. Harper Adams Agricultural College. The Veterinary Journal, 1931, p. 10.

Summary:

This paper presents data obtained in the treatment and control of Avian Coccidiosis. Experiments utilising iodine in milk are described and results obtained in a practical application tabulated. These indicate that the combination of this method together with sanitary measures affords a means of control of the disease. Results showing the inefficiency of chemical desinfection are recorded, and other chemical aspects of this work discussed.

Coccidiosis in Chickens. G. Mayall, Veterinary Journal, 1931, p. 45.

Wild birds spread the disease and rabbits, rats and mice harbour and spread the cysts. Flies, too, carry infection by transmitting unsporulated cysts to fowl faeces in which these sporulate and cause further infection to chicks. Mysterious outbreaks where every possible precaution to avoid infection has been taken may be attributed to the agency of flies.

GENERAL

Poultry Diseases in India. D. A. Turkhud. Iffley, Kodaikanal. Indian Veterinary Journal, 1931, p. 389

The following three diseases are met with in India.

1. Fowl cholera. This disease can readily be prevented by injecting chickens with anti fowl-cholera vaccine. This vaccine may be had from the Veterinary Research Institute at Muktesar.
2. Fowl typhoid. A vaccine prepared from the causal organism is now under trial at the Muktesar Institute.

3. A third disease, which during the past few years has caused such a havoc among fowls in India and other countries, was first accurately described by Doyle in England, who called it „Newcastle Disease". It has been carefully studied by Cooper at Muktesar, and tentatively named in India as „Ranikhet Disease". Psittacosis is probably akin to this disease, if not identical with is.

Importance of the Poultry Industry to the Veterinary Profession. Editor: Veterinary Journal, Jan., 1931.

The poultry industry, instead of being a sideline to general agricultural farming, is now a firmly established branch of the live stock industry.

In America greater attention has been paid to the study of diseases than in other countries, and it is encouraging to be able to present a number of the Veterinary Journal devoted almost entirely to articles on poultry.

In England there are workers in several laboratories whose whole time is occupied in researches into poultry diseases.

There was a tendency on the part of the poultry farmer to ignore the veterinary practitioner, this state of affairs no langer exists and it behoves the veterinary practitioner to keep abreast of the times by acquiring all the available knowledge on the subject, and by being able to impart this knowledge when required.

Tumors in Birds. Beitrag zur Kenntnis der Geschülste des Haushuhns. Dr. Karl Schuchmann. Archiv für Tierheilkunde, 1931, p. 154.

Detailed description of various tumors of the liver and the ovary. (Fibro-adenomata, sarcomata.)

Tumors of the ovary occur rather frequently. Nothing definite is known of the cause. Literary data from 71 publications forms the conclusion of this article.

Laparotomy in a Pullet. H. G. Lamont. Ministry of Agriculture, Stormont, Belfast. Veterinary Journal, 1931, p. 47.

The subject of the operation was a White Leghorn pullet which had an exceptional egg record in a laying test. After operation, recovery was uneventful, and the hen recommenced laying within 14 days.

NUTRITION

The relative Values of Cod Liver Oils from various Sources. J. C. Drummond and T. P. Hilditch. Empire Marketing Bd., Pub. 35, 1930, London, pp. 129, pl. 1, figs. 5.

This is the complete report of an extensive investigation undertaken under the auspices of the Empire Marketing Board of Great Britain on the composition, manufacture, and medicinal value of cod-liver oil. The report includes a critical discussion of the methods of determining the vitamin A and D content of cod-liver oil; summaries of the color, free acidity, mean saponification value, iodine value, and content of vitamins A and D in fresh liver oils of cod and other fish obtained in various localities in Newfoundland, Scotland, Iceland, and Norway, together with more detailed analyses of certain typical oils; a discussion of the biological factors affecting the vitamin content of cod-liver oils; a detailed report of the investigation of factors involved in the technical preparation of medicinal cod-liver oil; a brief report of codliver oil manufacture in Newfoundland; and specifications for cod-liver oils for medicinal use and for animal feeding.

The methods followed in testing for vitamins A and D and many of the results obtained have been noted previously from other sources. Of the oils from the important cod areas studied, those from Newfoundland were found to be of highest vitamin potency, followed in decreasing order by those from Iceland, Scotland, and Norway. The richest oils were obtained in areas where the food supplies for the fish were abundant and at seasons when the oil content of the livers tended to be low.

The standards suggested for cod-liver oil for human use are as follows: Color measured in a 1-in. cell, yellow Lovibond units not greater than 10 and red units not greater than 0.5; free acidity not greater than 0.5 per cent calculated as oleic acid; nonsaponifiable matter not greater than 1.5 per cent; and vitamin A color reaction preferably greater than 7 blue units when measured at a 10 per cent dilution according to the technic described. The standards recommended for cod-liver oil for administration to farm stock are the same for nonsaponifiable matter and vitamin A, and only slightly higher for color (not more than 15 units of yellow and 1 of red) and free acidity (not more than 1 per cent). „There is scarcely any doubt that the use of dark-coloured oils of high acidity in the feeding of farm animals is to be deprecated. These oils are naturally more prone to affect adversely the flavor of meat than those of higher grade, and there is an accumulation of evidence to show that they may be definitely toxic."

Cod Liver Oil for Poultry. R. M. Hopper. Dominion Experimental Farm, Brandon, Man. Canadian Poultry Review, February, 1931.

Minerals such as calcium and phosphorous are required in comparatively

large quantities by laying hens and pullets for the manufacture of eggs and egg shells. The digestion and assimilation of minerals require one of two things: An abundance of direct sunshine or an abundance of vitamin D. The supplying of vitamin D to poultry or exposing them to direct sunshine brings added health and increased egg production. Where birds are closely housed during Winter, such as is the case in most parts of Canada, they receive very little direct sunshine, and with the rations usually fed, poultry frequently do not receive all the vitamins they require for profitable egg production. Cod liver oil is rich in vitamin D and is one of the reliable sources of this feed.

Three extensive tests with cod liver oil were conducted at the Dominion Experimental Farm, Brandon, during the period from January to April in the years 1928, 1929 and 1930. The results from the three tests were uniformly in favour of feeding cod liver oil. The birds rerceiving oil produced 20 per cent more eggs than those that did not receive oil. The hatching results also showed a considerable increase as an average of fifteen more chicks were hatched from each hundred eggs laid by the oil-fed birds than from the eggs laid by the birds that did not receive oil. The chicks hatched from the eggs laid by the oil-fed birds had greater vitality as the mortality or death rate up to the time they were five weeks old was 10 per cent less than with the chicks hatched from the eggs laid by the birds that did not receive oil. The combined increase in egg production, hatching, and in the vitality of chicks, proved cod liver oil to be profitable when used in the ration for poultry during Winter.

The value of cod liver oil as a poultry feed depends entirely on its vitamin content, and only reliable tested brands should be used. There are several systems of feeding cod liver oil that will prove satisfactory. Mixing one pint of oil to each hundred pounds of dry mash is a good method. The oil will mix readily and without forming lumps in a flakey meal-like bran; the oil-laden bran can then be mixed uniformly in the dry mash, insuring an even distribution of the cod liver oil. Where the oil is to be fed in the wet mash or other feed, one to two teaspoonfuls to each twelve birds have been found adequate.

In the ration for early-hatched chicks, cod liver oil has also been found to be of value in promoting growth and preventing leg-weakness. Feeding at the rate of one to two pints of oil to each hundred pounds of feed has been found suitable amount for chicks.

The antirachitic Properties of Cod-Liver Meals. R. M. Bethke, G. Zinzalian, D. C. Kennard and H. L. Sassaman. Journal of Agricultural Research, Vol. 36, Nr. 8, 1928.

After the oil has been pressed from cod livers the dry substance remaining is called „Cod Liver Meal". According to tests made by the writer cod liver oil varies greatly as regards the content of vitamins A and D. This all depends on the liver from which the oil is extracted. In his experiments referred to above the writer ascertained how and to what extent cod-liver meal varies in its content of vitamin. For this purpose 156 one day chicks were fed in 6 different groups. Group I received soft food without liver-meal. In the other groups additions of cod-liver meal and cod-liver oil were tested as regards their antirachitic action. The birds were under observation for six weeks. As a result of the examination of the bones it was proved that the action of the cod-liver meal varied greatly. In one case there was even no evidence that the liver-meal possessed antirachitic qualities. The growth of the chickens ran parallel with the content of vitamin D. The analysis of the liver-meal showed great variations in protein and fat content. The further

course of these tests proved that the action of this liver-meal has no connection with the content of fat. The same conclusion was reached with experiments on rats. It is therefore not advisable to use cod-liver meal as an antirachitic substitute for cod-liver oil.

Cod Liver Oil for Turkeys. Purvis Miller. The New Breeder's Gazette, Vol. XCIV, Nr. 2 Febr. 1929. Ref. Züchtungskunde, 1929, p. 400.

Turkeys in general suffer from an imperfectly developed chest and the bones are often crooked. In consequence of this they frequently suffer from lack of mineral matter. Lime and phosphoric acid are especially needed which must be fed lavishly if the bones are to be developed properly. As by-feed limestone-grit, oyster-shells and bone-meal are to be recommended. As cod liver oil is a good aid to the assimilation of the lime, the writer also added it to his daily ration of mineral food for young turkeys. The result was that these birds had a well developed chest while birds from the same flock which however were reared by a neighbour showed the usualpercentage with badly developed chest and bones.

Vitamin Color Reactions. A Review of the Literature. H. J. Fischer and E. M. Bailey. Agric. Exp. Station, New Haven, Connecticut. Journal of the Association of Agricultural Chemists, 1930, p. 352.

This review is an attempt to show the present state of knowledge of colorimetric methods for estimating vitamins, in which cases belong all the chemical methods thus far used. Each of the four vitamins for which color tests have been proposed will be discussed in order.

Description of: Vitamin A. The Drummond-Watson Test. The Rosenheim-Drummond Test. The Carr-Price Test. The Fearon Test. Other Tests.

Vitamin B. The Yendrassik Test.

Vitamin C. The Bezssonoff Test.

Vitamin D. The Shear Test. The Bezssonoff Test. The Stoeltzner Test.

Follows Bibliography of 85 numbers.

Conclusions: The evidence at present does not justify the conclusion that chemical tests thus far devised can be relied upon as adaquate measures of vitamin potency, but some of the procedures suggested appear to be promising. Spectometric methods supplemented by color tests are regarded by qualified critics as worthy of further investigation.

Vitamin B. Facts and Phenomena. Prof. J. L. Rosedale. Singapore. The National Utility Poultry Society Yearbook, 1931, p. 99.

In Singapore has been built up in the past three years a biochemical department. The nutrition work is well supported. In 1927 two workers in the Dutch East Indies claimed to have isolated Vitamin B in pure form. However vitamin B is by no means a single entity, two or more substances at least are concerned in its action. To get the proper value of the yeast or rice polishings anti-beriberi substance, another substance must also accompany it in the diet A small green lentil, „phaseolus radiatus" is a good source of supply.

We have found that as we proceed down the zoological tree that the amino-acid lysine, which is important for the growth of rats, gradually gives place more and more to histidine.

The Quantitative Determination of Vitamin D. Prof. Eduard Poulsson and Herman Lövenskiold. Biochemical Journal, Vol. XXII, no. 1, 1928.

Summary:

A quantitative method for determining vitamin D is described. Its chief features are the following.

1. The same rats are used for the preparatory period as for the test period.
2. Preparatory period. The rats are put on a Steenbock and Black diet 2965, or a similar diet. After about 25 days a skiagram of the left knee-joint is taken, and the rats are again weighed.
3. Test period. The antirachitic substance be tested is given for 10 days after which another skiagram is taken and the rats are again weighed.
4. The efficiency is indicated in units per g. on a principle analogous to that adopted by the United States Pharmacopoia in its prescription for vitamin A.

Studies on A avitaminosis in Chickens. I. Lesions of the respiratory Tract and their Relation to some infectious Diseases. II. Lesions of the upper alimentary Tract and their Relation to some infectious Diseases. O. Seifried. Princeton-Marburg. Journal of experimental Medicine, 1930, pp. 519, 533. (Ref. Zentrallblatt für Bacterologie, Ref., 1931, p. 380.

Avitaminosis causes atrophia and degeneration of the epithelium of the mucosa and of the pituitary glands. This process is followed by the replacement of the original epithelium by horned flat-epithelium which originates from the cylinder epithelium. The pituitary of the nose is also affected so that the sense of smell is lost. By the loss of the whip cells and cessation of the secretion the protective elements of the pituitary membrane are weakened. This causes all kinds of infections.

The conduits of the pituitary glands can become stopped up and widened by propped up phlegm and necrotic material. These symptoms are somewhat similar to diphtheria.

Phosphate metabolism in B Avitaminose in Pigeons. Ueber den Phosphatidstoffwechsel bei der B-Avitaminose der Tauben. Schmitz und Tatsuji Glivaoka. Biochem. Z. 193, 1—18, 1928. (Ref. Züchtungskunde, 1930, p. 182.

The shrinking of the brain to something like one sixth of the normal size is characteristic of B avitaminose in pigeons. Simultaneously intensive qualitative changes take place. The content of cholesterin is increased while the content of phosphate decreases. The B avitaminose would appear therefore to cause a disturbance of the equilibrium of the metabolism in the brain.

The writers tried to influence the symptoms of pigeon beri-beri by repeated daily doses of phosphate. The doses were given subcutaneously. Feeding experiments were carried out simultaneously in cases where the doses were administered through the gullet. Egg lecithin was used for administering through the gullet.

Various test groups were fed with a normal mixed food while others received exclusively husked rice. In both tests a number of pigeons were given a daily subcutane injection of Lecithin but the others were not further treated.

In the case of those pigeons fed with a normal mixed food no abnormal symptoms were observed. Common pigeons which had received Lecithin injections showed signs of increased excitability. The number of Erythrocites did not show any changes. The untreated carrier pigeons quickly showed symptoms of pigeon beri-beri. Carrier pigeons which had received Lecithin injections behaved in the same manner as the common pigeons which had been treated in a similar manner, namely nervous and quarrelsome. Notwithstanding this the symptoms of B avitaminose gradually made their appearance.

The progress of the growth of the cholesterine could not be prevented by the Lecithin injections. The decrease of phosphate was completely curtailed.

Content of vitamin in grain and vegetables. Teneur en vitamine des graines de céréales et de légumineuses. J. Bucek. C. r. Soc. Biol. 100, 1929.

The quantities of grain necessary for the prevention of Polyneuritis in pigeons have been somewhat exaggerated. The health of the birds is assured by the feeding of vitamin B in 0.75—1,0 g. wheat, barley, rye, oats, maize, peas beans. (Living weight of the birds is on the average 350 g.) Nothing is known regarding the quantities necessary for preventing polyneuritis and loss of weight. In opposition to the estimates known at present 1/10 of the quantity is necessary for feeding sufficient vitamin B to the organism.

The role of vitamins and minerals in stock feeding. II. Minerals. J. B. Orr. J. Ministry Agricult. 37, 115—129, 1930.

This treatise gives a short review of our knowledge in regard to the necessity of minerals to swine, young, grazing and milk cattle as well as to birds. While formerly it was preferred to remedy the lack of minerals by a complicated mixture of salts, to-day, owing to the greater knowledge of the necessity of minerals to animal organism, we have come to prefer a simpler mixture. It has indeed been proved that ground limestone, common salt and bonemeal and in goiter-areas very small quantities of iodine suffice to make up the lack of minerals which occurs in practically all usual rations. If grain waste forms a great part of the ration, there is in consequence a higher surplus of phosphoric acid, and ground limestone and common salt is all that is necessary. If on the other hand the ration is poor in phosphor the addition of bonemeal will prevent or cure disturbances in the mineral metabolism.

The Importance of Minerals in Turkey Feeding. W. H. Lapp. The Aberdeen-Angus Journal, Vol. 10, Nr. 11. 1928. (Ref. Züchtungskunde, 1929, p. 218.

The badly developed chests of turkeys is often a result of the crooked breast bones. The crooked bones are the result of lack of minerals in the food as turkeys need a very large mixture of minerals. The birds should not, therefore, be left to themselves, but should be given a mixed food which is very rich in minerals. It is impossible to control the food ration when the birds are allowed to run free to a certain extent and even when they are allowed full freedom in fields they do not, in the majority of cases, take enough minerals. An extensive test gave the following result: when fed with a mixed food rich in minerals not even 1 % of the birds had crooked bones, a medium supply of minerals showed 19 % of the birds with badly formed bones and in a third group which contained no special content of minerals 56 % of the

birds had crooked bones. Besides a better development of the bones, a better plumage, smaller death-rate and a greater activity of the birds were a result of the feeding of minerals. In conclusion the writer states that turkeys should never be reared together with hens.

Nutrition Diseases in Fowl. Nützungs- und Fütterungskrankheiten des Geflügels. R. Reichardt. Deutsche Tierärztliche Wochenschrift, 1930, p. 289.

Modern poultry breeding with the rationalizing forms in connection with keeping, feeding and breeding as well as the forcing of growth and laying, can very easily lead to endangering the constitution of the birds. The forcing of the laying capacity and the consequent claims made on the laying capacity and the consequent claims made on the laying organs probably lead to many diseases. While formerly diseases of this nature caused 2 %—4 % of the deaths the present percentage is 10 %—20 % and has risen in some districts to even 40 %. Decrease in the egg production, poor fertilisation, bad hatching, weak chickens, misshapen eggs, and finally a complete falling of in laying are the results of diseases of the sexual organs. The exaggerated claims on the cock also exercise an unfavourable influence on the pairing and impregnation capacities. From investigations made by Stieve it has been proved that wrongly mixed food, namely shortage of vitamin and minerals, a too large percentage of fat and carbon hydrates cause, in a few weeks time, damage to the testicles and ovary, accompanied by sterility. A too large percentage of albumen in the food can lead to kidney diseases, paralysis, intestinal and joint troubles. Feather and egg eating are the results of unsatisfactory and one-sided feeding. Shortage of vitamin, causes the various known species of diseases and weakens the resistance of the birds against infection. For the elimination and treatment of these kinds of diseases prevention and avoidance of the causative factors is of the utmost importance. The business aspect should be brought into harmony with the demands of hygien.

The Nutritive Requirements of Poultry. VII. Growth in chickens. M. Moir. Rowett Institute u. a. Scott. J. Agricult. July 1929. (Ref. Züchtungskunde, 1930, p. 415.

The foregoing experiments proved that turkeys which were fed solely on grain or grain products were very backward in developing. The writers used this connection in order to test the action of certain additions, mostly of an albuminous nature, on such a basic food.

The birds were put under observation at an age of from 3 to 7 days and kept under similar conditions. In some cases full cream milk, skimmed milk, meat and bonemeal, semi-solid buttermilk, synthetic milk, soya-meal with 3.13 % mineral salts, a mixture of soya, earthnut and linseed meal with 3.13 % mineral salts, fishmeal, dried milk, goat's milk, 3.75 % mineral salts and intensive mixture consisting of bran, fishmeal, dried buttermilk and bonemeal were added to the basic food.

Results proved that milk and milk-products had the most favourable influence on the growth. Skimmed milk and full cream milk are of equal value as regards their action. The other milk products also proved to be valuable additions to the basic food but were not so favourable in their action as natural milk.

Good results were also obtained from feeding stuffs which are rich in animal protein and minerals such as fishmeal, meatmeal, bonemeal a.s.o. In

many tests vegetable protein containing sufficient minerals, proved to be quite as valuable additional foods as fishmeal.

The action of minerals alone as an addition to the basic food, was, in proportion also favourable. It was therefore assumed that the favourable action of fishmeal is to a certain extent to be ascribed to the high percentage of minerals contained therein.

Food mixing with various kinds of protein gave very good results. This addition appears to be the most suitable for replacing milk products.

A cerebellar Disorder in Chicks apparently of nutritional Origin. A. M. Pappenheimer and M. Goettsch. Journal Am. Vet. Med. Association, 1931, p. 715.

Growing chicks maintained on a diet consisting of milk powder, casein, starch, yeast, cod-liver oil, salts and filter paper develop ataxia, tremors, retraction or twisting of the head, clonic spasms of the legs and stupor. These symptoms may appear suddenly, usually between the 18th and 25th days, and may end in death. Definite lesions are found in the cerebellum. These consist of edema, necrosis and hemorrhages. Hyaline thrombi are found in the capillaries in and about the degenerated areas.

Less Feed with All-Mash. International Baby Chick News. March 1, 1931, p. 9.

During a 337-day test at the Delaware experiment station, a pen of 55 birds was fed a scratch and mash ration, while a similar pen received an all-mash ration. The average egg production was 140.8 and 138.6 per bird in the respective lots. Birds receiving scratch and mash required 65 lbs. more feed per dozen eggs than those on all-mash. Mortality records showed that six birds in pen one and two birds in pen two died during the experiment.

Pokeweed Berries not poisonous for Chickens. J. M. Hendrickson and K. F. Hilbert. Veterinary College, Ithaca, N.Y. Journal of the Am. Vet. Med. Association, 1931, p. 557.

1. Ripe pokeweed (Phytolacca decandra) berries did not cause any symptoms of poisoning or any ill effects when fed in large quantities, even over a period of approximately three weeks to five chickens and one duck.
2. Some birds do not eat the berries readily at first but apparently develop a taste for them after consuming a few.

Effect of Storage in finely divided Feeds upon the Stability of the D Vitamin of Cod-Liver Oil. L. C. Norris, G. F. Heuser, H. S. Wilgus. Memoir 126, Cornell University Agric. Exp. Station, 1929.

Summary:

1. The storage of cod-liver oil in a mixture of finely divided feeds at the minimum protective dosage resulted in a material destruction of vitamin D when this feed mixture was kept in burlap sacks at room temperature from twelve to sixteen weeks preceding consumption. The quantity of vitamin D destroyed varied directly with the length of storage.
2. When the quantity of cod-liver oil stored for sixteen weeks was two and one half times the minimum protective dosage, an approximately normal rate of growth was obtained and rachitic lameness and reduction in bone ash were prevented.

EGGS, TABLE POULTRY

Some Poultry Statistics. P. A. Francis, Ministry of Agriculture and Fisheries. Veterinary Journal, 1931, p. 3.

Since 1913, the egg production has increased over 100 per cent, which represents an addition to the national income of over £ 7.000.000.

The approximate annual value of home produced eggs and poultry is some £ 24.000.000, a sum equal to the value of the grain crop, including wheat, oats, barley. The total value consumed in this country is over £ 45.000.000. The average consumption was in 1928, 132 eggs per head, of which 75 were imported. The import of eggs in shell in 1928 was less than in 1913. The estimated average difference of prices between English and Dutch eggs in 1913 was 1½ d. per dozen. By 1928, this difference had increased to 3 d. per dozen, and in 1929 to 4.3 d. per dozen.

Less Poultry. Reduction in Storage. International Baby Chick News, May, 1931.

The monthly report of the Bureau of Agricultural Economics, United States Department of Agriculture, shows the following cold storage holdings of frozen poultry on April 1, 1931:

Total frozen poultry 69,957,000 pounds, compared with 105,708,000 pounds April 1, 1930 and a five-year average of 87,086,000 pounds.

Broilers 8,875,000 pounds, compared with 15,631,000 pounds April 1, 1930 and a five-year average of 11,702,000 pounds.

Fryers 6,218,000 pounds, compared with 9,918,000 pounds April 1, 1930 and a five-year average of 6,769,000 pounds.

Roasters 20,459,000 pounds, compared with 28,924,000 pounds April 1, 1930 and a five-year average of 26,418,000 pounds.

Fowls 14,744,000 pounds, compared with 13,337,000 pounds April 1, 1930 and a five-year average of 11,223,000 pounds.

Turkeys 6,335,000 pounds, compared with 13,000,000 pounds April 1, 1930 and a five-year average of 10,620,000 pounds.

Miscellaneous poultry 13,326,000 pounds, compared with 24,898,000 pounds April 1, 1930 and a five-year average of 20,354,000 pounds.

Per Capita Consumption Now 267 Eggs. Poultry Tribune for June, 1931, p. 18.

Washington, D. C.—U. S. Department of Commerce figures show that each of the 121,000,000 persons in this country in 1929 used 267 eggs as compared with 219 eggs two years previously and 206 eggs in 1899. — GHM.

Report on Eggs and Egg Products. S. Alfend. U. S. Food and Drug Administration, St. Louis, Mo. Journal of the Association of official Agricultural Chemists, 1930, p. 405.

Recommendations: It is recommended:

1. That methods for the determination of fat (acid hydrolysis), lipoids and lipoid phosphoric acid (P_2O_5) be studied collaboratively.
2. That methods for the determination of total phosphoric acid (P_2O_5) with consideration of the use of potassium hydroxide and magnesium acetate or nitrate as fixing agents be studied.
3. That methods for the determination of added sugars be studied.
4. That the tentative 98° C. vacuum oven method be adopted as official (first action).
5. That the tentative 112°—117° C. air oven method be further studied collaboratively with a view to its adoption as a official method.
6. That the tentative method for the determination of ash be adopted as official.
7. That the tentative method for the determination of unsaponifiable matter be studied collaboratively with a view to its adoption as an official method.
8. That the method for the determination of water soluble protein nitrogen precipitable, by 40 per cent alcohol in egg products be further studied in conjunction with the same methods for alimentary pastes and flour; with consideration of the use of 1.2 per cent sodium chloride solution for extracting the sample and of alumina cream for clarifying this project to be accompanied by collaborative work if possible.
9. That the method for the determination of acid soluble phosphoric acid (P_2O_5) be further studied and be accompanied by collaborative work.
10. That a study be made of methods for determining ammonia nitrogen and reducing substances as dextrose.

Is a fresh Hen Egg a means of binding Sausage meat according to Foodstuffs Chemistry? Ist frisches Hühnerei ein Wurstbindemittel im Sinne der Nahrungsmittelchemie? J. Bongert and E. Hobbing. Institut für Nahrungsmittelkunde der Tierärztlichen Hochschule zu Berlin. Berliner Tierärztliche Wochenschrift, 1931, p. 258.

Eggs are chiefly used for good quality liver-sausage and Mortadella-sausage. By this the flavour of the sausage is improved and it remains longer fresh. This mixing with eggs must not be put on a par with the mixing with amylum, milk-casein etc. The sausage is improved when mixed with eggs. Water-binding through albumen does not take place in boiling-sausage.

Specific Putrefaction of Hen Eggs due to Serratia Sp. H. W. Bennets. Australian Veterinary Journal, 1931, p. 27.

Conclusions:

a. A specific putrefaction of new laid eggs is described. The condition is characterized by the development of a typical penetrating objectionable odour, by breakdown of yolk and white which are mixed and contain flocculi, and by the production of a pigmented membrane lining portions of the shell.

b. The condition is apparently due to the infection of the eggs with Serratia sp.

c. The disease has been reproduced in fresh eggs by inoculating them with cultures of this organism.

d. The writer is of the opinion that infection of the eggs takes place in the genital tract of the hen.

The Quantitative Determination of Egg in Ice Cream. N. C. Smith. California State Department of Agriculture. Journal of the Association of official agricultural Chemists, 1930, p. 272.

Summary:

The results of a limited study of methods for a quantitative determination of egg solids in ice cream are presented; as well as a method of procedure for the analysis of ice cream to determine the egg yolk content.

This method depends upon the quantitative recovery of lipoid phosphorus from ice cream by means of the Roese Gottlieb (Mojonnier) extraction of the lipoids followed by a colorimetric determination of the phosphorus.

Data are presented relative to the lipoid phosphorus content of ice cream and various ice cream constituents, also of eggs and egg products. By the use of this data, particularly the average values for egg free ice cream and for dry eggs yolk, a formula was prepared by the use of which the percentage of dry egg yolk in ice cream is calculated from the lipoid phosphorus content. From this value the fresh egg yolk percentage may be readily approximated by multiplying the former by two. If desired, the results may be expressed in terms of whole egg solids by using in the formula a different constant which is derived from the average value for lipoid phosphorus in whole egg solids. The validity of these formulas has been established and their general application is limited only by the amount of data offered in support of them.

A large number of analyses have been made, and in no case has the calculated percentage of egg yolk differed markedly from the amount actually present.

New Egg Storage. Canadian Poultry Review, March, 1931.

Gas storage, a new development in keeping egg fresh until the market is ready to absorb them, is interestingly described in the current issue of the News Letter of the Dominion Dairy and Cold Storage Branch at Ottawa. Briefly described, the eggs packed in 15-dozen packages and placed in a metal container known as an Autoclave. When these are placed in the storage compartment the air within the Autoclave is pumped off and replaced by carbon dioxide gas. As a further precaution against the presence of oxygen in or near the eggs, the air outside the container is also drawn off and replaced by CO_2. Theoretically, and it is proving true in practice, an egg stays fresh directly in proportion to the extent to which it contains CO_2, and the two bug-bears of cold storage, mould growth and fungi, can develop only in the presence of oxygen with a humidity of 85 degrees at temperatures of 33 degrees F. or over. Owing to the absence of oxygen no mould growth takes place and the egg comes out of storage in a most attractive condition.

An Automatic Plucker. Feathered World, May 15, 1931.

Several automatic plucking machines have been put on the market of recent years. One of these is the Bingham, advertised in our columns this week. This machine was exhibited at the Dairy a season or two ago, and since then has undergone several improvements and a modification in price. Our representative was recently given a demonstration of the machine in action, and he made a careful note of the three features which most practical poultrymen would look for in an appliance of this type-efficiency of operation, speed and price.

The Bingham undoubtedly plucks — and also stubs — very cleanly. The operator who gave the demonstration had not plucked more than fifty birds, so could not be considered highly skilled, but he appeared to have no

difficulty in manipulating the fool-proof apparatus, and in no instance was the skin of the bird torn. This is avoided by keeping the bird on the move, so that the plucking plates have not time to draw in the skin as well as the feathers, the principle being that four circular aluminium discs revolve on a slightly different plane to each other, with the result that they come together in turn. When they meet they nip the feathers, and the manufacturers claim that their latest model attains the excellent speed of fifty plucks per second. Our representative timed several birds put through the plucker, and the rate of plucking varied from under two minutes in the case of the easier specimens to three and a half minutes in the case of a young battery reared rooster. This was without stubbing. The latter and the removal of the flight feathers would probably add another three minutes, making, perhaps, seven minutes in all. A good average speed for hand plucking is probably six birds an hour — plucked and stubbed — so there appears to be a reasonable saving of time even with an unskilled operator. A skilled man could probably handle a dozen birds an hour with ease.

Finally with regard to price, a machine without a motor (which many poultry farmers possess) costs £ 20; if supplied with electric motor suitable for 2 or 3 phase alternating current and motor starter, £ 32. Care and maintenance should not prove expensive items, as although there is a certain amount of vibration and rattle after much use, the parts of the machine and their operations are so simple that there is not much than can get out of order. „Belt slipping" was one of the drawbacks to the earlier types, but this, we understand, has been attended to; and rubber bands have been attached to the edges of the plucking plates to eliminate noise. There is no tendency to choke.

Fattening Ducks. Enten-Schnellmastversuche. A. Wiertelewski. Züchtungskunde, 1930, p. 356.

During the fourth and fifth weeks the food absorption increases considerably and in consequence weight is gained. In the ninth week the food absorption surpasses the gain in weight and it is therefore of importance to stipulate a good time for killing. The birds should be killed before the first change of feathers otherwise the advantages of the fattening are lost.

During the first 4 or 5 weeks a greater quantiy of albumen must, in comparison, be given. It is during these weeks that the birds grow most intensively.

GENERAL

Soviet Poultry Husbandry Program. J. C. Pincus. The United States Egg and Poultry Magazine, 1931, p. 2.

„A thorough study of Russia is, at the present time, impossible. Nevertheless, the most superficial type of analysis will show that the Soviet Government has a good chance to maintain itself and to bring its plans to a substantial degree of success." Wallace Bett Donham, Dean of the Graduate School of Business, Harvard University.

Author gives tables which show the export in tons from the year 1906 to 1913 inclusive. During the war and the revolution the export of both, dressed and live poultry stopped, but starting with 1923 the export was resumed and a table shows the extent of this trade up till 1929.

After the revolution several cold storage plants were established. Russia is divided into regions and in every one of these regions is also a regional department of agriculture, which receives directions from Moscow.

Writer gives a description of the present methods in Russia and the five-year plan for Poultry.

The Department of Agriculture publishes an excellent monthly publication: „Soviet Poultry Husbandry and another publication published twice a month is published by the Poultry Cooperative Federation. There are several poultry periodicals in the provinces. Special advanced poultry courses are given at the leading colleges of agriculture. Research work is also done at various institutions.

Description of Barneveld's Poultry Trade. Edited by Major and Alderman of Barneveld. 1930. Obtainable gratis.

Preface:

The publication of this booklet readers, has a double purpose. Firstly, may you enjoy looking at the photos it contains and secondly, may these same photos lead you to decide to honour our village with a visit, which will be a great pleasure to us.

If you are interested in poultry breeding you can get no better insight than at Barneveld, one of the most important poultry centres in Europa. Here you will see the farms of those men, who, with firm will and devoted energy, have created their own breed of hens, which lay beautiful, tasty brown eggs, bear the name of our village and have become world famous. In Barneveld you will see that everybody, Municipal Authorithies as well as both breeders and merchants, will be only too pleased to be of service to you, in giving information regarding the most important things connected with this poultry breeding centre.

Here you will see the extensive breeding stations, some of which have a capacity of 130.000 eggs per 3 weeks, the rearing-houses, whose prosperity is partly due to the free market traffic in our village, can supply your wants in every respect. Should you perchance be in Barneveld on a Thursday, you will be amazed at the traffic in and around our Egg Hall. As each year showed an

increase in the number of eggs brought to market (in 1930 more than 76.000.000) the Municipal Council saw themselves obliged to provide a larger hall as the old one had become to small. From the packinghouses, which have been built near the hall, the eggs are despatched to all parts of the world. You will see how, by means of an inspection machine, hundreds of eggs are examined simultaneously, in order to control their quality, for we may not supply anything but the best to our customers. During your visit you can also see our poultry market, which, with its turnover of more than 1½ million animals, may be considered one of the largest in Holland.

If you take a walk through our village you will see the statue of our village hero, Jan van Schaffelaar, who jumped from the tower in 1482, thus saving his comrades lives at the sacrifice of his own. This statue will prove to you that, even in the rush of present day life we do not wish to forget our famous history. Finally, the object of this booklet is to call to you: „Come and see us, we shall welcome you heartily."

Poultry, Rabbit and Pigeon Breeding in Belgium. L'Aviculture, la Cuniculture et la Colombiculture en Belgique. Office de Commerce et d'Exportation du petit Elevage, 105 Rue de Moorslede, Bruxelles, 1931.

The „Commercial and Export Office for Small Livestock" created to the initiative of the Belgian Ministry of Agriculture and under the auspices of the National Association of Avicultural Societies, has for its scope the promotion in foreign countries of a better knowledge of Belgium's wonderful breeds of poultry, pigeons and rabbits and to act as intermediate between belgian breeders and foreign buyers. The Bureau is able to supply and ship to any part of the World choice speciments of any of the breeds here described.

Follows richly illustrated description of: Malines, Campines, Belgium Game Fowl, Ardennaise, Barbu d'Anvers, Belgian Homer, Ghent Cropper, Carneau, Antwerp Smerle, Flemish Giant, White Rabbit of Termonde, Rabbit of Beveren, Blue Rabbit of St. Nicolas, Pearl-Grey of Hal, Belgian Hare.

There excist in Belgium 520 poultry societies, appliated to 9 provincial federations. All these are grouped in one National Federation.

The „Feathered World" Year Book for 1931. Edited by R. and O. Comyns Lewer and A. P. Thompson. The Feathered World, 9 Arundel Street, Strand, London, W.C. 2, 1931.

Introduction by the Editors:

Anyone who is interested in poultry abroad will find „The Feathered World" Year Book (the annual of the British Poultry Industry now in its 20th year) of more than passing interest. Not only are there many articles on such topics as the Latest Methods of Keeping Hens Intensively, Housing, Ventilation, Drainage, Chick Rearing, Mendelism applied to Sex-Linkage, Feeding, Starting Egg Farming: but such attractive subjects as Fruit Growing, Colour Breeding in Budgerigars, Ornamental Waterfowl, Pheasant Farming and Fancy Pigeons also receive attention. The Editors make a special feature of good photos of which there are over 150 and practically every breed of Fowl, Bantam, Pigeon and Duck is illustrated. The book is published at the resonable price of two shillings and sixpence from „The Feathered World", 9 Arundel Street, London, W. C. 2.

Contents:

Bantam Articles. Budgerigars. Chicks, How to Rear. Drainage. Events of 1930: The Year that has passed. Feeding the Intensive Hen. Fruit, The Best Side-Line. Hampers and Baskets. Henny Game. Hints and Menus. Housing the Intensive Hen. Judge 'em, How to. Laying Tests, British. Mendelism applied to Sex-Linkage. Pheasants for Pleasure. Pigeon Breed Articles. Pigeon Clubs, Specialist. Pigeon Pie for Hungry Novices. Poultry Breed Articles. Poultry Clubs, Specialist. Poultry Instructors. Poultry Farming is no Job for Fools. Poultry Industry in 1930. Pouters of the Continent. Random Shafts. Table Pigeons, Breeding. Ventilation for Poultry Houses. Waterfowl, Ornamental. Women's Institutes, Hints to Poultry Enthusiasts of. Young Fanciers' League.

The American Poultry Record. Official Organ of the American Record of Performance Council. W. E. Robinson and Sam. L. Althouse. „Poultry Item" Publishing Company, Sellersville, Pennsylvania, 1931.

Preface:

In presenting the First Annual American Poultry Record to the consideration of the poultry public, its publishers express the hope that it may be given a critical examination by each man and woman who is interested in the improvement of poultry in America.

This improvement should come along both production and exhibition lines.

We have made great progress in recent years but it should be kept in mind that the five highest individual contest records are held by hens in foreign countries, including Canada.

It is true that acceptance for record in this volume is based wholly on egg production, but it is hoped that we may have such co-operation from the American Poultry Association as will enable us in future volumes to include birds that have proven their exhibition quality in the Show Room.

It is also in contemplation to add in the future the feature of Advanced Registration, in which will be entered hens and cocks having recorded daughters in such number as may hereafter agreed upon.

The primary purpose of the American Poultry Record is to give deserved publicity to breeders whose hens have proven their high quality as egg producers by way of the supervised trapnest. Home records, so often advertised may be, and no doubt usually are authentic. However, Contest Record of Performance has been and will continue to be the foundation for the majority of the breeding work on this continent, so far as the production side is concerned.

The prospective purchaser of hatching eggs, baby chicks or breeding stock has only to refer to the Record for information that is unquestioned.

We cannot too strongly express our appreciation of the assistance so freely given us by the Supervisors and Managers of the Egg-Laying-Contests. It was only through their hearty co-operation that the publication of the Record was made possible.

We gladly guarantee the reliability of all advertisers found in this volume. They are undoubtedly the most representative group of breeders ever assembled in a trade publication.

The first annual American Poultry Record contains 240 pages and the Record Section carries between 12,000 and 15,000 official records. There are 50 pages of valuable data on contests and contest work, including 100 illustrations. The Breeders' Section consists of about 100 advertisements of leading breeders.

The 1930 section, which includes all official 200-egg records, contains

about 10,000 individual production records. Balance of records — about 4,000 — are published in co-operation with American Record of Performance Council and are therefore all official registered records from 1920 to 1930. Thus, all officially registered records are brought up to date with the publication of this work. However, the so-called „true American poultry records" start with 1930. As announced by the editors, W. E. Robinson and Sam L. Althouse, publication will be continued for at least three years, once annually under the present arrangement.

With this permanent publicity for official records, there will be a decided increase in interest in laying contests, R. O. P. associations (the stepping stones to Contest records) and Record Clubs similar to those in other livestock work.

The National Utility Poultry Society. Yearbook 1931. 53 Victoria Street, Westminster, S.W. 1, London.

Contents:

Foreword by chairman R. Newbery. Rules. Annual Report, 1929-30. The annual General Meeting. The Society and its Branches. Affiliation of existing Society. Affiliated and associated Societies. Members Priveleges. Marking of preserved Eggs; Egg grading Regulations, etc. The National Egg Laying Test, 1930-31. Report of National Egg Laying Test 1929-30. The National Egg-laying Test, Bentley and Milford, Records for the last six Years. Associations and specialist Clubs. World Poultry Congress, 1930 by Fred Elford, Ottawa. Factors connected with Testing B.W.D. by H. P. Hamilton. Battery Brooding by A. J. Cottle Facts and Phenomena by Prof. J. L. Rosedale. Pure Breeds by T. R. Robinson. How we build South View Poultry Farms by A. Hopwood. Utility Production over the Border by R. Scott Miller. Poultry on the ordinary Farm. With special Reference to the Utilisation of Home-grown Foodstuffs by E. T. Halnan. Artificial Illumination for Egg Production by Professor Raymond T. Parkhurst. Where do you put Constitution? by W. Powell-Owen. Legal Notes by E. G. Hamlin. The Register of Breeds. List of Members and Fellows.

PHYSIOLOGIE AND ANATOMIE.

Experimental studies of the bird hypophysis. I. Effects of hypophysectomy in the brown leghorn fowl. J. B. Mitchell Jr. Physiological Zoology, Vol. II, S 411—437, 1929. Ref. Züchtungskunde, 1929, p. 491.

There are still many points to be cleared up in connection with the functional importance of hypophysis, due on the one hand to the dissimilarity and systematic character of the test birds and on the other hand to the varied methods of investigation. The definite results which have up to the present be obtained can be divided into three kinds.

1. In mammals, birds and amphibeans the loss or defect in the front part of the hypophysis causes retardation of growth or definite dwarfing. On the other hand such symptoms of retardations can be removed or rapid growth can commence as soon as extract of this part is fed to the organism.
2. In mammals it appears that in the absence of front part the genital system does not develop, namely, atrophisis in the fully developed organism. As hypophysic-transplanting after ectomy of the gonades cannot prevent this symptom it must be assumed that the hypophysic hormon can only act through the gonades. By administration of daily doses of front-part-

substance a stimulation of the gonades and in some cases premature puberty can be created in mice.

3. After hypophysectomy in mammals hypoplasia of the thyroid gland arises, which can be cured by injections of front-part-substance.

The writer set himself the task of examining brown Leghorn hens from this standpoint. The operation was carried out generally on birds of 3—6 weeks old but sometimes on 5 months old birds. The removal of the front part of the hypophysis took place through the mouth. Infection seldom occurred. Details about the course of the operation which was carried out under a binocular microscope are given. A complete ectomy of the front part was achieved in some of the operations. The macroscopic examinations of the parts of the gland removed did not prove sufficient to confirm complete success. Some of the birds were therefore histologically examined after death. In many birds regenerations were found later which had often commenced in the remaining parts of the gland. Totally 161 birds were operated. In successful ectomy of the front part the hens died at the latest after two weeks. In 52 of these cases the microscopic examination showed that no other organs had been injured. Partial hypophysectomy was not always deadly. On the other hand the birds did not thrive, which showed itself for example in the failing of the moult and the non-appearance of puberty. Specific injury of the gonades was not observed. The changes in the thyroid gland were more serious. These became smaller, much colloid congregated in the follicles, the secretoric epithel became flat. This very remarkable state was recorded by photographs and tables.

Action of Extract of Hypophysis on the Thymus of young Ducks. Action spécifique des Extraits préhypophysares de Boeuf sur le Poids du Thymus du jeune Canard. J. Schockaert. Comptes rendus de la Société de Biologie, 1930, p. 226.

Extract of prehypophysis had a stimulative effect on the thyroid gland and a minimising effect on the thymus gland.

Integumental grafting in the domestic fowl. Transplants of combs, spurs and feathers in the study of sex-dimorphism. A. W. Kozelka. Journal of Heredity, Vol. 20, 1929, S. 3—14. (Ref. Züchtungskunde, 1929, p. 222.

Von Zawadosky was the first to assert the law of aequipotentiality of the body of cocks and hens in connection with the hormonal divergences. Perhaps a repetition and an exact analysis of the foregoing experiments would be of use in curtailing or confirming this law. While the interpretation of the foregoing information is quite correct the investigation reports fail entirely, so that it is almost impossible to obtain a unanimous opinion.

Contrary to what has been done formerly the writer transplanted the secundary organs and not the gonades as the producers of the morphogenital active hormon. The operations were carried out within the first 3 days after hatching. White and brown Leghorns were used as test birds. Caridroit had already carried out autoplastic comb transplantations. The homoio-plastic transplantations were not very successful. Only 7 remained until sexual maturity was reached. It was observed that although combs of cocks transplanted on to hens did not develop typically male, still they were distinguishable from combs transplanted from hens to cocks. A comb transplanted from a hen to a cock will show typical female differences. Auto-plastic transplanted spurs from cocks appear to develop normally on all parts of the legs. The typical relation of spur

and legbone is of no importance whatever to the development of the spurs. Spurs transplanted from hens develop according to the female type without reference to origin. Experiments in which the spurs were transplanted from hens to cocks were unsuccessful. The chapter on transplantation of feathers was devoted almost entirely to the experiments by Danforth.

The Function of the interstitial Cells of sexual Glands in Fowls. Sur le rôle des cellules interstitielles des glandes sexuelles chez les gallinacés. Conditionnement du plumage femelle et de l'oviducte chez la poule domestique. Bulletin Assoc. Anatomistes Nr. 3, p. 38—45, 1928. (Ref. Züchtungskunde, 1930, p. 86.

There is now hardly any doubt concerning the hormonal restrictiveness of the secondary sexual distinctions in fowls. That the place of formation of these hormons is in the gonades has also been confirmed by numerous experiments. It is also of great importance that the question should be decided as to what cell elements of the genital glands are to be indicated as the origin of the hormon. The writer has already written several works on this problem without, however, giving a final or determined solution. There are three species of cells in question:

1. The germinative elements (Spermatocytes in the testicles, the ovocytes in the ovary).
2. The somatic elements
   a. Vegetative cells, (the Sertolic cells in males, follicle cells in females).
   b. Interstitial cells (in the testicles also called Leydig cells).

According to earlier investigations of the writer the origin of the vegetative and interstitielle cells is the same, both originate from the coelomepithel of the embryo. The above mentioned question regarding the psysiological significance of some elements can only be answered by the fact that experimentally often one, or other of these kind of cells are eliminated. One of the chief difficulties of this problem is the limited scope of the experiments, of which mention has already been made: even when, under careful handling, success is attained in eliminating one special kind of cell, the possibility must be taken into consideration that these elements might still remain under changed appearances. The writer believes the following to be final with regard to the testicles of cocks: after extensive treatment with X-rays the Spermocytes disappear completely; the secondary sex characteristics remained however. After incomplete castration the sex characteristics of the comb reappeared when the testicle regenerate contained both Sertoli and interstitial cells. Sertoli cells alone are not sufficient. The interstitial cells must therefore be looked upon as those elements which produce male sexual hormon.

In the case of hens matters are still more difficult. Up to the present it has been repeatedly stated that in the absence of ovocytes and follicle cells, it was still possible to distinguish the secondary sex characteristics (female feathers and oviduct). According to this only the interstitium can be looked upon as the producer of the female sex hormons. In confirmation of this, three separate cases are described in detail:

1. The ovary of a hen about 2 months old was incompletely ectomised. Shortly afterwards various male feathers appeared and the comb became of the male type. At the age of 1½ years post-mortem examination was held. At this time the feathers differed in formation from male feathers. The oviduct was considerably smaller. The genital glands show the following: The right gonade is not developed. On the left the remains of the

ovary had developed into a testicle tissue complex (9 x 15 mm.), which contained no trace of ovary tissue; there were no ovocytes, no follicle cells but on the contrary a large number of embryonal sexual chords and Sertoli cells. Interstitial cells are inlaid which resemble Leydig cells in the interstititum of an ovary.

2. In the case of a second hen treated in the same way the formation of the male sex characteristics were almost similar. In the 18th month however, during the moult, female feathers appeared. Frequently to there appeared again later a female sex hormon which had been absent in the first months. The post-mortem examination was held in the 21st month. With the exception of one small cyst, ovocytes and follicle cells were absent. There were only male sexual chords without spermatogenese and numerous interstitial cells. The sexual chords were not so numerous as in the first case. They were in a state of decay and their histiologic elements were found in the state of changing into interstitial cells. This instertitium resembles a normal ovary in ovary way.
3. In a further case the course of the sex changes was the same as in 2. A specially remarkable feature noticed at the post-mortem examination was the large developmt of the oviduct. In this case too neither ovocytes nor follicle cells were present in the gonade but on the contrary a large interstitium that in the connection with the sexual chords changed during the destruction of same.

The Effect of Yolk Injections on the Plumage of an ovariotomised Brown Leghorn hen. Archiv für Entwickelungs-Mechanik, Bd. 121, S. 87—95. 1930. Ref. Züchtungskunde, 1930, p. 179.

After Fellner (1925) had confirmed that lipoids could be obtained from the yolks of hen eggs which, when injected subcutaneously into rabbits, cause the same uterus reaction as placenta lipoids, the writer request that it be pointed out that this lipoid is also concerned in the female differentiation of hen feathers.

The ovary of a 10 day old brown Leghorn was ectomised. In spite of this the feathers were typically female but the comb etc. were as in a castrate. Gradually the male feathers appeared so that at the age of 9 months the bird had partly male and partly female feathers. Follicles with typical cock feathers were marked with Indian ink. When the abdominal cavity was opened no sexual organs were found; contrary to the results in other experiments in connection ectomy of the ovary, the right gonade had not developed. After six months directly before the egg yolk injections male characteristics were formed on the marked follicle feathers.

For the injection the yolk of a freshly laid hen egg mixed with a 5 c. cm. Ringer solution was administered subcutaneously or intra-abdominally. In total 5 yolks were injected. In spite of ovary ectomy, first the female feathers changed. Two explanations are discussed: either a post-reaction of the ovary might be considered or the ectomy could not have been complete, the fragment of the ovary would then consequently have been lost. A post-reaction of the ovary would be contrary to all other reports as it has been proved that the sex hormons disappear from the blood within about 3 days if there is no fresh supply.

The result of the injection of egg yolk is that on various parts of the body, where originally male feathers were round, female characteristics are formed. A complete female change never took place. Female sexual hormons must also be present in the yolk of the egg. The question as to whether besides the generative elements the sexual organs may also be considered as hormon producers was not discussed. (Probably it is here only a question of hormon

accumulation in the egg yolk, such as that referred to by B. M. Zawadowsky for the hormon of the thyroid gland. Ref.)

The Whites and Shells of Duck Eggs. Recherches sur la formation du blanc et de la coquille des oeufs de canes. Grigory Chomkovic. Revue de Zootechnie, Nr. 9, S. 173—184. 1927.

46 Test ducks (40 Peking ducks and 6 Rouen ducks) of one year old were killed and it was so arranged that the eggs were often found in various stages of development in the oviduct.

Conclusions:

1. The formation of the thin liquid white takes place in the uterus, where at the same time the forming of the shell takes place.
2. The formation of the thin liquid white is caused by water which enters by way of osmosis. In this way the minerals and some albumens enter the inside of the egg. It is not, therefore a question of the penetration of pure water but of the determination of the increased lime content in the eggs found in the uterus.
3. The thin liquid white is enveloped in a layer of tough white which first appears behind the isthmus and which can always be found both in the uterus and in the completed egg.
4. The egg membrane begins to form while the egg is passing through the isthmus. Its division into 2 membranes and completion take place before the egg enters the uterus.
5. The chalazae forms directly after the impregnation of the white but only become visible to the naked eye after the forming of the membranes.
6. During the passage through the oviduct does not undergo any changes of dry matter and lime content but it absorbs water, on an average about 20 %.
7. The forming of the shell, which takes place in the uterus, is accompanied by an increase of dry matter and lime content in the skin and shell of the egg.
8. The duck egg remains in the istmus for about 3—4 hours after ovulation. During this period 50 % of the final weight of the white is formed. The time necessary for the forming of the membrane in a duck egg is from about 2—3 hours. It remains considerably longer in the uterus about 13—14 hours, during which time the shell is formed. The thin liquid white develops in about 6 hours. The complete development of a duck egg takes therefore at least 24 hours.

Formation of Duck Eggs. L'étude sur la formation de l'oeuf chez les canards. II. partie; Croissance des follicules et la formation du jaune. G. Chomkovic. Annalen der Tschechoslowakischen Akademie der Landwirtschaft, Bd. III. 1928. (Ref. Züchtungskunde, 1930, p. 414.

The writer took it upon himself to observe these processes in ducks as to the present all investigators had only experimented with hens. In some cases the results agreed with those obtained in the experiments on hens. As in the case with hens the growth of the follicles and the formation of the yolks is most intense during the days immediately preceding the laying of the egg. These processes take place simultaneously on about 5—7 follicles which are almost ready to break. During the intensive growth the yolk is placed in layers round

the centre of the egg. Even when degenerate follicles are present the egg can be normally developed.

How is the Egg laid? Wird das Hühnerei mit dem stumpfen oder spitzen Ende voran geboren? Dr. Becker, Bevensen, Hannover. Deutsche Tierärztliche Wochenschrift, 1931, p. 199.

This question was discussed 40 years ago and the opinion of breeders was divided.

Recent examinations with Röntgen rays proved that the egg usually lies in the oviduct (uterus) with the pointed end towards the cloaca, so that it can be assumed that it is also laid with the point foremost.

It would be interesting to study the position of the head of a chicken in an egg that had been laid with the blunt end foremost.

Anatomy of Oviduct. Kana ovidukti ehituses ühenduses tema funktiooniga. J. Tehver. Estnische Tierärztlche Rundschau, 1930, p. 81.

Treatise on the anatomy of the oviduct and the ripening of the egg based on data from literature. (Ref. Tierärtzliche Rundschau 1931, p. 273.)

Anatomy of the Comb of the Coq. Recherches sur la Substance Mucoïde de la Crête du Coq. A. Berdnikow and Ch. Champy. Comptes Rendus de la Société de Biologie, 1931, p. 804.

The combs of cocks and of laying hens contain a characteristic network of elastic fibres in which mucus is present. This mucus is not present in the combs of capons and non-laying hens.

The writers have made a chemical examination of this mucus. It contains no glucose but biuret. The mucus showed typical reactions to thionine, carmin and the liquid of Curtis.

Effect of Cold on the Combs of domestic Cocks. Les Effets du Froid sur la Crête des Coqs domestiques. F. Caridroit et V. Régnier. Comptes rendus de la Société de Biologie de Paris, 1929, p. 432.

During the severe cold in February and March 1929 characteristic changes were noticeable in the combs of cocks, which were not properly protected against frost. The writer was able to ascertain 3 types of such frost injury which, in their material, were often connected with certain conditions of the comb.

1. Full grown cocks with large combs (130—150 mm.). Comb and wattles became hard, the blood in the lacunes was frozen. Necrosis appeared in the points of the combs. In April this necrotic tissue fell off and the result was rounding off of the combs and a shortening of the wattles.
2. Full grown cocks with small combs (less than 130 mm.). The blood circulation did not appear to be disturbed. On the contrary these combs underwent a change whose course was similar to the after effects of castration. It began in the beginning of February, raeched its climax at the beginning of March and returned to the normal condition at the end of April. An examination of the testicles showed them to be normal.
3. Immature Cocks. The length of the combs varied between 90 and 110

mm. The larger combs showed symptoms similar to those mentioned above and in the smaller combs the growth was somewhat retarded.

The Differences between Bones of domestic and wild Birds. Die Vergleichung von Skeletteilen bei Haus- und Wildvögeln mit Rücksicht auf Marktpolizei, Fleischbeschau und gerichtliche Diagnostik. J. Potuznik. Prager Arch. f. Tiermed. Jg. 9, pg. 71.

Veterinary surgeans have not as yet a sufficiently extensive and reliable handbook at their disposal in which the bones of domestic and wild birds are compared. Potuznik has therefore made an extensive study of the principal bones in various kinds of birds. The article is made clearer by 138 illustrations and 7 tables, so that it forms a handy and practically complete book for the veterinary surgeon, either in the capacity of a markets inspector or expert in legal proceedings.

Only those bones are treated which one has most frequently to deal with in practice, among others, sternum, clavicula, coracoid, scapula, humerus, metacarpus, pelvis, femur, tibiotarsus, the united portions of the breast-bones with the parts of the ribs appertaining thereto and finally the caudal end of the vertebral channel.

Potuznik treats swimming birds (goose and duck) pigeons and fowl-like birds (turkey, pheasant hen, guinea-fowl).

Double Rectum. Doppelter Enddarm bei einem Junghahn. Dr. Becker. Bevensen, Hannover. Tierärztliche Rundschau, 1931, p. 311.

The rectum devided 12 cm. before the cloaca into two tubes of equal length each with an end opening. These two branches of the rectum were joined by a mesenterium 1 cm. in width. The writer had never before seen this in the thousands of post-mortem examinations which he had carried out.

Body Measurements in Fowl. Körpermaszaufnahme an Geflügel. G. v. Aughi. Mezögazdasagi Kutatasok, Bd. III. 1930. (Ref. Züchtungskunde, 1930, p. 415.)

The work is chiefly concerned with the technic of the body measurements. The works of Hauschildt and Weinmiller are discussed.

On endocrine Weights of brown Leghorns. Mary Juhn and James B. Mitchell Jr. American Journal of Physiology, 1929, p. 177.

The weights of the following organs in cocks, capons and hens were ascertained: brains, hypophyse-frontlobes, thyroid glands, kidneys and spleen. From these the general weight of the body was averaged: In general this was the same for cocks and capons and for hens somewhat less. The age of the birds and the date of the experiments is given. There was a considerably variability in the weights of all the organs. In the case of the capons hypertrophy of the hypophyse and a falling off of the weight of the thyroid gland was observed.

Castration of Turkey Cock. Kastrationsversuche am Truthahn. G. J.v an Oordt and C. J. J. van der Maas. Arch. f. Entw. mech., Vol. 115, 1929, p. 651—667. (Ref. Züchtungskunde, 1929, p. 448.

These two works appeared shortly after one another and showed, in reality, the same results so that they will be treated collectively here.

There are many secondary sex characteristics in turkeys which can be homologised with those of pheasants, domestic hens etc. but there are also others which are specific. The weight of a full grown turkey cock is from 8—9 K.G. and of the hen 4—4,5 K.G. The skin differences in the head are combined in a head-decoration, throat wattles and featherless and strongly blooded skin parts (compare the „Red" of pheasants). These characteristics are more strongly marked in the cock than in the hen. Contrary to most breeds of poultry the turkey hen possesses small spurs; they are mostly only very small while those of the cock are much larger. The plumage of the cock is much brighter and more metallic than that of the hen. The breast feathers, the so-called „Brush" are sometimes seen in the hen but then always much smaller than in the cock. Mating and fighting instincts as well as the typical call „Gobbling" are only found in the cock.

In male castrates the head ornament becomes typically henlike. When castrated young the spurs remain small as in the hen. Contrary to the cock there are no changes in the plumage. Mating and fighting instinct disappear and the characteric call is no more produced.

TOME IV. No. 3 OCTOBER 1931.

INTERNATIONAL REVIEW OF POULTRY SCIENCE

OFFICIAL ORGAN OF THE

WORLD'S POULTRY SCIENCE ASSOCIATION

EDITOR

Dr. B. J. C. TE HENNEPE

ROTTERDAM (Holland)

This Review is free to all members of the World's Poultry Science Association.

All subscriptions should be sent to the Editor: Dr. B. J. C. te Hennepe, Rotterdam or to the Secretary-Treasurer: Dr. G. F. Heuser, Cornell University. Ithaca, N.Y., U.S.A.

SUBSCRIPTIONS

One pound or equivalent ($ 5.00) annually in advance.

The **personal membership** of the W.P.S.A. amounts to	£ 1.0.0.	per year
For **affiliated societies** „ „ „	5.0.0.	per year

ADVERTISEMENT RATES

One page, per issue	£ 2.10.0
Half page, per issue	„ 1.10.0

Special attention is called for

BREEDERS' ADVERTISEMENTS

which are now fixed on **£ 2-.-. per full page, during 1 year.**

TOME IV. No. 3 OCTOBER 1931.

INTERNATIONAL REVIEW OF POULTRY SCIENCE

OFFICIAL ORGAN OF THE

WORLD'S POULTRY SCIENCE ASSOCIATION

EDITOR:

Dr. B. J. C. TE HENNEPE

ROTTERDAM (Holland)

PRINTED BY G. B. 'T HOOFT – ROTTERDAM (HOLLAND)

THE INTERNATIONAL REVIEW OF POULTRY SCIENCE IS EXCHANGED WITH THE FOLLOWING 79 JOURNALS. WHO FOLLOWS?

AUSTRIA. NUTZGEFLUEGELFREUND, Franz Josefs Kai 7-9, Wien I.

GEFLUEGELWIRTSCHAFT, Lichtenauergasse 5, Wien II.

OESTERREICHISCHE TIERARZT, Wallnerstrasse 6, Wien.

OESTERREICHISCHES ZENTRALBLATT FUER TIER- UND PFLANZENZUCHT, Eichgraben a/d. Westbahn, N.O.

ZENTRALBLATT FUER KLEINTIERZUCHT, Riemergasse no. 6, Wien.

AUSTRALIA. THE AUSTRALIAN VETERINARY JOURNAL, University of Sydney, Faculty of Veterinary Science.

AUSTRALASIAN POULTRY WORLD, 78a Victoria Str., Melbourne.

THE JOURNAL OF THE DEPARTMENT OF AGRICULTURE OF SOUTH AUSTRALIA, Victoria Square Adelaide.

POULTRY, Sydney, N.S.W. 32.

VICTORIAN POULTRY JOURNAL, Melbourne, Vic.

BELGIUM. AVISELECT, Rue Emm. Mertens 29, Bruxelles, Woluwe.

BULLETIN OFFICIEL, Les Colombes, Heide-Calmpthout.

CULTURA, Mr. Kessler, Nieuwstraat, Capellen.

DE KRAAIER, Gebr. Leens, Boom.

LAND, TUIN EN NEERHOF, Baliestraat 97, Gent.

HET VLAAMSCH DIERGENEESKUNDIG TIJDSCHRIFT, Brusselschesteenweg 625, Gent.

HET VLAAMSCH PLUIMVEEBLAD, Brussel-Woluwe.

CANADA. THE CANADA POULTRYMAN, 618 Homer Street, Vancouver.

THE CANADIAN POULTRY JOURNAL, 3 Blythwood Crescent, Toronto 12.

THE CANADIAN POULTRY REVIEW, 184 Adelaide Str., W., Toronto.

CZECHO-SLOVAKIA. VESTNIK CESKOSLOVENSKE AKADEMIE ZEMEDELSKE, Dr. Eduard Reich, Prague.

ENGLAND. CHANTICLEER, E. Kirsch, Normandy near Guildford.

EGGS, Rudgwick, Sussex.

THE FEATHERED WORLD, 9 Arundel Street, Strand, London, W.C. 2.

HARPER ADAMS POULTRY JOURNAL, Newport.

LANCASHIRE UTILITY POULTRY SOCIETY'S REPORT, Richard Green, Farringdon Park, Preston, Lancashire.

MEMOIRS UNIVERSITY OF CAMBRIDGE, Department of Agriculture, Cambridge.

NATIONAL POULTRY JOURNAL, Milford, Surrey.

POULTRY WORLD, 4 Carmelite Street, London, E. C. 4.

THE JOURNAL OF THE MINISTRY OF AGRICULTURE, 10 Whitehall Place, London.

UTILITY RECORD, Official Organ of the National Utility Poultry Society, 53 Victoria Street, London, S.W. 1.

THE VETERINARY BULLETIN, Veterinary Laboratory, Ministry of Agriculture and Fisheries, Weybridge, Surrey.

FRANCE. LE PETIT JOURNAL AGRICOLE, 61 Rue Lafayette, Paris.

LA REVUE AVICOLE, 34 Rue de Lille, Paris.

GERMANY. ARCHIV FUER GEFLUEGELKUNDE, Kaiser Wilhelmstr. 66, Berlin-Nieder Schönhausen.

DEUTSCHE GEFLUEGEL-ZEITUNG, Vaihingen a. d. Enz.

DEUTSCHE LANDWIRTSCHAFTLICHE GEFLUEGEL-ZEITUNG, Steinmetzstr. 2, Berlin.

EIER-BOERSE, Nürnbergerstr. 28, Berlin.

GEFLUEGEL—WELT, Georgstrasze 38/33, Hannover.

GEFLUEGEL—BOERSE, Solomonstr. 16, Leipzig.
GEFLUEGEL—FARMER, Lütznerstrasse 29, Leipzig.
ZUECHTUNGSKUNDE, Nikolausberger Weg 9, Göttingen.

HOLLAND. AVICULTURA, Misset, Doetinchem.
BEDRIJFS-PLUIMVEEHOUDER, Doetinchem.
SCHAKELS, Maasstraat 106 II, Amsterdam (Z.).
TIJDSCHRIFT VOOR DIERGENEESKUNDE, Prins Mauritslaan 9, Den Haag.

HUNGARIA. STATISTIKAI HAVI KOZLEMENYEK, Keleti Károly, U. 7, Parterre 14, Budapest.

INDIA. THE INDIAN POULTRY GAZETTE, Narayangunj, E. Bengal.
THE INDIAN VETERINARY JOURNAL, P. Srinivasa Rao, Madras.

IRISH FREE STATE. JOURNAL OF THE DEPARTMENT OF AGRICULTURE, Dublin, C. 17.

ITALIE. BASSA CORTE, Salita Inf. S. Tecla 36, Genova.

JAPAN. JOURNAL OF THE JAPANESE SOCIETY OF VETERINARY SCIENCE, Prof. Naoshi Nitta, Faculty of Agriculture, Imperial University, Komaba, Tokyo.

NETHERLANDS-EAST-INDIA. LANDBOUW EN VEETEELT, Petjenongan 72, Batavia-Centrum.
N. I. BLADEN VOOR DIERGENEESKUNDE, Bataviasche weg 54, Buitenzorg.

NORWAY. TIDSKRIFT FOR FJAERFAEAVL, Raadhusgaten, 9 III, 10-3, Oslo.

POLAND. THE POLISH ECONOMIST, Electoralna 2, Warsaw.

SOUTH AFRICA. THE JOURNAL OF THE S. A. VETERINARY MEDICAL ASSOCIATION, 61 Simmondsstreet, Johannesburg.
THE S. A. POULTRY MAGAZINE, Whiteco House, Box 286, Bloemfontein. S.

SPAIN. MUNDO AVICOLA, Arenys de Mar, Barcelona.

SWEDEN. SVERIGES ALLMäNNA FJäDERFäAVELS FöRENINGS TIDSKRIFT, Garvaregatan 7, Stockholm.

SWITZERLAND, DIE TIERWELT, Zofingen.

UNITED STATES OF AMERICA, ALABAMA NATIONAL EGG LAYING DEMONSTRATION PROGRESS REPORT, Alabama Polytechnic Institute, Auburn, Alabama.

THE BABY CHICK, 1230 West Washington Boulevard, Chicago.

EXPERIMENT STATION RECORD, U. S. Department of Agriculture, Washington, D. C.

GOLDEN BUFFS. New Albany, Indiana Bruce W. Ulsh, Owner.

HATCHERY TRIBUNE, Mount Morris, Ill.

HINTS TO POULTRYMEN, Agric. Exp. Station, New Brunswick, N. J.

INTERNATIONAL BABY CHICK NEWS, 3223 Troost Ave., Kansas City, Mo.

NEW ENGLAND POULTRYMAN, 4 Park Street, 2. Boston, Mass.

NEW JERSEY AGRICULTURE, Rutgers University, New Brunswick, N. J.

OHIO AGRICULTURAL EXPERIMENT STATION, BIMONTHLY BULLETIN, Wooster, Ohio.

POULTRY CRAFTSMAN, 327 Towne Avenue, Los Angeles, California.

POULTRY CULTURE, 2607 North Boston Place, Tulsa, Oklahoma.

POULTRY ITEM, Sellersville, P.A.

POULTRY PROJECT BULLETIN, Mich. State College of Agriculture, East Lansing, Michigan.

POULTRY SCIENCE, L. E. Card, Urbana, Ill.

POULTRY TRIBUNE, Mount Morris, Ill.

RELIABLE POULTRY JOURNAL, Dayton, Ohio.

U. S. EGG AND POULTRY MAGAZINE, 110 North Franklin Street, Chicago.

BREEDING

Laying capacity of crossings between Black Rhinelanders and White Leghorns. Die Legetätigkeit aus der Kreuzung schwarzer Rheinländer mit weiszem Leghorn. H. R. von Langen. Archiv für Geflügelkunde, 1930, p. 40.

The F. 1 generation showed good laying capacity (average 189,5 eggs). The laying capacity of the F. 2 hens was not so good (136,6 eggs). In the F. 3 generation the production was 127,8 eggs, accompanied by a great variability of the hens viz. from 32 to 211 in 53 hens.

Influence of Nutrition on Hatching Results. Der Einflusz verschiedener Fütterung, Eiweisz in verschiedener Menge und von verschiedener Herkunft, auf Brut und Nachzucht. Albrecht. Deutsche landwirtschaftliche Geflügel-Zeitung, 1930, p. 981.

Various groups of 10 hens and 1 cock were fed on: much animal protein (ratio 1 : 2, 7), much vegetable protein (ratio 1 : 2,7), little protein (ratio 1 : 11,8) and with normal food. The laying capacity with much animal and vegetable protein was just as high as with normal food. The hatching results were as follows: normal food 67,4 %, much vegetable protein 79,8 %, much animal protein 63,6 %, very little protein 23,1 %.

The rearing of the chickens showed similar results. Food which is rich in protein does not therefore have any harmful effect on the hatching and rearing results.

Changes in the Egg during Incubation. Ueber das Verhalten der anorganischen Bestandteile bei der Bebrütung des Hühnereies. Iseki Toshinovi. Physiologisches-chemisches Institut der Med. Akad. Nagasahi. Hoppe-Seyler's Zeitschrift für physiologische chemie 1930, p. 189. (Ref. Deutsche Tierärztliche Wochenschrift, 1931, p. 269).

A fresh egg contains 0,075 % CaO. During incubation it contains 0,076 %, 0.1289 % and 0.3495 % after the 7th, 14th and 18th days respectively.

Directly after hatching a chicken contains 0,4788 %CaO. The content of CaO increases considerably in 21 days.

After 14 days the egg shell weighs 2,7323 grams or 5,82 % of the weight of the egg; after 18 days 2,3405 grams or 5,02 %, after 21 days 2,245 grams or 4,8 % of the weight of the egg.

New experiments in connection with the Damage done by Bacteria in Artificial Hatching. Neue Beobachtungen über bakterielle Schäden bei der Kunstbrut. R. Wagener. Archiv für Geflügelkunde, 1930, p. 182.

B. pyocyaneus is found in duck eggs as well as in hen eggs. Eggs which have been hatching 3 days show peculiar spots on the shell. Finally a yellow or reddish-brown crust forms on the egg shells. It is not known how the bacteria get into the eggs. They appear to have preference for eggs of certain birds.

Combatting Manure-eating and Toe-pecking of chickens. Das Kotfressen und Zehenpicken der Küken. Mehner. Deutsche Landwirtschaftliche Geflügelzeitung, 1930, p. 884.

The wire-netting floor is the best preventitive for manure-eating. The results of this bad habit are all kinds of disturbances of the intestines and infectious diseases. After 8—14 days the chickens may be allowed to run on ordinary ground.

The best remedy for toe-pecking appeared to be the keeping of the chickens in the dark and only allowing them light every two hours during feeding time, which lasts half an hour. This method was carried out for ten days and was successful.

Yolk assimilation during the embryonic Development of the chick. M. A. Jull and B. W. Heywang, Bureau of Animal Industry, U. S. Department of Agriculture. Poultry Science, Vol. IX, 1930, p. 393.

Conclusions:

The general conclusions to be drawn from the observations made in this paper are as follows:—

1. The per cent yolk weight of chick weight at hatching time varies among hens, sometimes significantly between different pairs of hens.
2. The per cent yolk weight of chick weight at hatching time is independent of the sex of the chick.
4. The per cent chick weight of initial egg weight is independent of initial egg weight; that is, regardless of the initial egg weight the per cent chick weight tends to be the same.
5. The per cent chick weight of initial egg weight is independent of the sex of the chick.
6. The per cent yolk weight of initial egg weight various among hens, sometimes significantly between hens.
7. During the embryonic development of the chick, the rate of yolk assimilation bij the embryos in the eggs from one hen sometimes differs significantly from the rate of yolk assimilation by the embryos in the eggs from other hens.
8. The correlation between initial egg weight and chick weight at hatching time minus unassimilated yolk weight frequently varies significantly between hens.
9. The correlation between initial yolk weight and chick weight at hatching time minus unassimilated yolk weight frequently varies between hens.
10. The genetic constitution of the hen apparently determines the rate of the assimilation of yolk material during embryonic development.

WHERE THE 5th WORLD'S POULTRY CONGRESS WILL BE OPENED.
VIEW FROM THE CAPITOL OVER ROME.

The influence of starving and feeding mash and scratch grain, respectively, at different times on yolk absorption in chicks. Burt. W. Meywang and Morley A. Jull Bureau of Animal Industry, U. S. Department of Agriculture. Poultry Science, 1930, p. 291.

As a general conclusion, it may be said that it is probably true that feeding chicks has a slight affect on the rate of assimilation of the yolk in day-old chicks and that early feeding is not harmful. The feeding of mash as compared with scratch grains seems to cause a less rapid rate of yolk assimilation.

The effects of Breed on the growth of the chick embryo. Theodore C. Byerly, Bureau of Animal Industry, U. S. Department of Agriculture. The Journal of Morphology and Physiology. Vol. 50, No. 2, December, 1930.

The growth of chick embryos of heavy and light breeds and the reciprocal crosses between them is described. The embryos of the heavier breed and the hybrids were found to be somewhat heavier than the embryos of the lighter breed from the tenth day of incubation to hatching time. In eggs of the same weight from the two breeds the size difference tends to disappear toward hatching time, probably due to the equivalence of the strictly limited food supply. It is pointed out that the size difference is more probably due to difference in the proportion of cells dividing at a given time than to a difference in duration of mitoses.

The mortality of the hybrid embryos was intermediate between that characteristic of the parent breeds, while the percentage of monsters in the hybrids was less than that for either parent breed. There is thus some indication of heterosis.

Conclusions:

1. Differences in size of embryos of the same age and from eggs of the same size, from matings of Single-comb Rhode Island Reds, Single-comb White Leghorns, and the reciprocal crosses between the two, are slight.

2. Rhode Island Red and hybrid embryos are a little heavier than White Leghorn embryos of the same age during the latter half of the incubation period.

3. This difference decreases or disappears by hatching time, due to the limitation of food.

4. The hypothesis of Castle and Gregory, that difference in size of rabbit embryos of larger and smaller races may be accounted for by difference in rate of cell multiplication, cannot be extended to the chick embryo, because these differences in size are present only during a part of the developmental period.

5. Castle and Gregory have presented too little evidence to warrant the acceptance of their hypothesis for the case of the rabbit.

6. Mortality of the hybrid embryos is less than that characteristic of the eggs from which they were hatched, when fertilized by sperm from males of the same breed.

7. Percentage of terata in the hybrids is reduced below that of either parent stock.

The sex ratio in the domestic fowl in relation to antecedent egg production and inbreeding. Morley A. Jull. From the Bureau of Animal Industry, U. S. Department of Agriculture. Biological Bulletin, Vol. LX, No. 2, April, 1931.

Conclusion:

It seems apparent that inbreeding in the domestic fowl can hardly be regarded as a sex-influencing factor, even when close inbreeding is practiced.

The Sex Ratio in the domestic Fowl in Relation to Size of Family. M. A. Jull. Bureau of Animal Industry. Poultry Science, 1931, p. 125.

Considering the three sex ratios for each kind of mating each year among themselves, it is clear that there are no significant differences between any two of them. Apparently, therefore, a sex ratio determined on the basis of families of all sizes may be taken as representative of the normal sex ratio, although Pearl (1917) rightly observes that „families under 10 cannot be considered as representative of the normal fertility of the **domestic** fowl." While this is true and while Pearl has shown that sex ratios based on families of less than 10 are not to be regarded as near the true biological norm as the sex ratio based on families of 10 or more, nevertheless, the data in this paper show that a sex ratio based upon families of all sizes, including those under and those over 10, may be taken as representing the normal sex ratio of any particular flock.

The data in Table IV indicate that apparently there is no preferential mortality among the chicks from hatching time to the fall of the year, when the sex records were made.

The data in Table IV also indicate that the normal sex ratio of the domestic fowl is slightly under 50.00.

Studies in Hatchability IV. The Effect of Intercrossing inbred strains of chickens on Fertility and Hatchability. M. A. Jull. Bureau of Animal Industry. Poultry Science, 1930, p. 149.

The data on hatchability given in Table II show that in both the intercrossed inbred Barred Plymouth Rocks and intercrossed inbred White Leghorns, 1929 matings, the percentage of hatchability is significantly higher than in the inbred matings in 1928, ($43.773 \pm 2.616 - 23.12 \pm 2.483 = 20.645 \pm 3.607$ and $58.160 \pm 1.912 - 46.452 \pm 1.974 = 11.708 \pm 2.748$), whereas in both the non-inbred Barred Plymouth Rocks and non-inbred White Leghorns, the differences in hatchability percentages between the 1928 and the 1929 matings are not significant, ($56.361 \pm 1.886 - 51.921 \pm 1.880 = 4.440 \pm 2.663$ and $57.301 \pm 1.566 - 56.625 \pm 1.508 = 0.676 \pm 2.174$). These results are in agreement with those secured by Jones (loc. cit.) and others in crossing inbred strains of corn. The term heterosis, meaning hybrid vigor, has been given to the condition of rejuvenation resulting from the crossing of inbred strains.

The Sex-linked Method in Poultry Breeding. R. C. Punnett. Ministry of Agriculture and Fisheries. Miscellaneous Publications, No. 55. London. 1929. With 2 coloured plates.

Contents: General principles.

1. The Silver-Gold Pair of characters. The silver-gold classes, Choice of matings, obscured ground colours.

2. The Barred—Unbarred Pair of characters. Other types of barring, Precautions necessary, Keeping within the breed.
3. The Light Dark shank Pair of characters. White Wyandottes.
4. Practical aspect of Sex-Linhage.

Cause of the death of the Embryo in the Egg. Teetzmann. Deutsche Landwirtschaftliche Geflügelzeitung, 1931, p. 913.

The writer attributes the death of the embryo to the feeding of fishmeal in which the albumen is in state of decomposition. Hens also died after being fed with foods containing such fishmeal.

The chickens of hens fed with such food showed greater susceptibility for Bac. Pullorum infection than the chickens of other hens, which had been given a different kind of food.

Poultry Breeding for Egg Production. Ministry of Agriculture and Fisheries. Bulletin No. 19. London. 1931.

Foreword:

The question of the influence of breeding upon egg production is one of great importance to poultry keepers, and has long been of particular interest in the North of England. When the National Poultry Institute was established in 1921-22 it was decided to locate work on poultry research at selected centres where certain special problems could be most conveniently investigated. It was natural to select the North of England as the part of the country for an investigation into problems relating to breeding and its effect on egg production. It was therefore arranged that certain of the traditional methods of breeding, particularly those touching the effects of in-breeding, should be investigated under the direction of a Sub-Committee—the Northern Sub-Committee of the Ministry's Poultry Institute Advisory Council. By the courtesy of the Cheshire County Council a site for an experimental plant was provided at the School of Agriculture, Reaseheath, near Nantwich, and work has been in progress since 1924. The report which follows is, in effect, an interim report of the Sub-Committee on the work so far accomplished, the investigation not having yet been concluded. It appears in the form of a paper prepared by the Sub-Committee and presented by its Chairman, Professor J. S. Dunkerly, D. Sc., Ph. D., by special invitation of the Congress Committee at the 4th World Poultry Congress, held at the Crystal Palace, London, on July 22-30, 1930.

In the hope that this report may be of value in assisting in the elucidation of the problems relating to breeding for egg production, the Ministry issues it in the form of a Bulletin to make it available to all who are interested.

Contents: Stock, Plant, Management, Records, Method of Assessment of Fecundity, Design of Experiments, Limitation of Results, Methods of Mating, Results of Mating for Four Years, Fecundity, Infertility, Hatchability, Rearability. Age at Sexual Maturity, Weight at Sexual Maturity, Summary of Results.

Poultry Breeding in Belgium. L'Aviculture, la cuniculture et la Colombiculture en Belgique. Office de Commerce et d'Exportation du Petit Elevage, 105 Rue de Moorslede, Bruxelles. Ministre de l'Agriculture.

Description with plates of:

The Malines. The Campine-Braekel. The Belgian Game Fowl. The Ardennaise. The Barbu d'Anvers. The Barbu d'Uccle. The Belgian Homer. The Ghent Cropper. The Cameau. The Antwerp Smerle.

The „Commercial and Export Office for Small Livestock" created to the

initiative of the Belgian Ministry of Agriculture and under the auspices of the National Association of Avicultural Societies, has for its scope the promotion in foreign countries of a better knowledge of Belgium's wonderful breeds of poultry, pigeons and rabbits and to act as intermediate between belgian breeders and foreign buyers. The Bureau is able te supply and ship to any part of the world choice specimens of any of the breeds here described.

What to Expect of Pullets. New Jersey Agriculture, July 1931.

Well-raised pullets, early hatched and ready to lay in August, may be expected to produce about as follows during their first year (in terms of eggs per pullet per month):

		Without Lights			
August	12	December	3	April	23
September	10	January	14	May	20
October	12	February	16	June	11
November	6	March	22	July	9
		With Lights			
August	12	December	10	April	22
September	15	January	10	May	20
October	15	February	12	June	11
November	14	March	22	July	9

The later season pullets, ready to lay about October 1, might be expected to lay about as follows:

		Without Lights			
October	9	February	14	June	16
November	12	March	20	July	12
December	13	April	22	August	7
January	14	May	20	September	6
		With Lights (after Oct. 15)			
October	10	February	16	June	15
November	16	March	22	July	10
December	18	April	20	August	7
January	16	May	18	September	4

Such production standards as are here suggested are useful for the purpose of measuring the average production of any pullet flock from time to time during the year to see if they are doing as well as the average flock. These figures have been gleaned from actual flock records from hundreds of farms over several years, and thus should have some definite value as representing what the poultryman might reasonably expect from his well-bred, well-reared pullet layers. Keep these figures handy and compare the production of your pullets with them.

The Care of Baby Chicks. Prof. Willard C. Thompson. Bulletin No. 3. International Baby Chick Association, Kansas City, Missouri, 1931.

Contents:

First care important. What makes the baby chick industry profitable. Chicks first food. Chicks first home. How to feed at first. Use good commercial chick feeds. Milk feeds important. Avoid dirty brooders. Heat brooders ahead. Watch the brooder thermometer. Keep chicks comfortable. Do not use too small a house. What size house. Get the house ready. When chicks get older. Close confinement brooding. Have grass range or plenty of green stuff. How to have green stuff. Avoid chick losses. Do not allow crowding. Keep chicks busy. Watch your feed. Leg weakness, what to do for it. Preventing dampness. Sunshine or codliver oil. Watch these things. Some things to avoid.

On significant Modifications of Feather Type induced by Injections of female Sex Hormone. Oestrin, to Capons. A. W. Greenwood and J. S. S. Blyth. University of Edinburgh. Veterinary Journal, 1931, p. 42.

For the investigation two Brown Leghorns capons, castrated five weeks old, were employed. Injections of female hormone (oestrin) were commenced when the birds were 45 weeks old. The total amount of oestrin administered to each bird was 64.5 c.c.m. or 645 rat units in 32 days.

Various feathers growing in towards the end of the injection period were not of the typical colour and structure. Feathers developing later returned to the normal type. The explanation advanced is that the amount of oestrin injected was only sufficient to produce one of the ovarian effects namely the stimulation of the thyroid, while the larger doses given by other workers were sufficient to produce both effects and so call forth typical female plumage.

The Production of Hen-feathered Brown Leghorns by Breeding. M. A. Jull and J. P. Quinn. Bureau of Animal Industry. Journal of Heredity, Washington, D. C. April, 1930.

Conclusions:

It is obvious, therefore, that if, from the standpoint of inheritance, hen-feathering is due to a single factor, there must be one or more modifying factors that affect the results.

As a general conclusion it may be stated that not only is hen-feathering dominant to cock-feathering, as observed by Morgan and Punnett and Bailey, but that the results secured from the standpoint only of the inheritance of hen-feathering, suggest that hen-feathering may be due to a single factor, with modifying factors involved.

Report of Poultry Breeding Station in Rome. I primi tre Anni di Esercizio del Pollaio Provinciale di Roma. N. Carosi Martinozzi. Roma, 1930.

Contents:

Preface. Origin of Station. Various Breeds at the Station. Production of Birds. Nutrition. Incubation. Instruction and Propaganda. Statistical notes.

Poultry Course of Poultry Breeding Station in Rome. Riassunti delle Lezioni di Pollicoltura impartite durante i corsi temporanei. Federico Clementi. R. Scuola agraria media di Roma. 1929.

Contents:

Origin of Breeds. Anatomy. Various Breeds. Selection of Breeds. Incubation. Rearing. Nutrition. Capons. Fattening. Diseases.

DISEASES

INFECTIOUS DISEASES

PULLORUM

Rapid-blood-agglutination Test. Technik der Frischblutschnell-agglutination zum Nachweis der Pulloruminfektion der Hühner. H. Mieszner and G. Schütt. Hygienisches Institut der Tierärztliche Hochschule, Hannover. Deutsche Tierärztliche Wochenschrift, 1931, p. 3.

The technic of the new method, in which a drop of fresh blood is examined, and the preparation of the antigen are accurately described as well as the pseudo-agglutination.

Comparative Experiments with Serum-Agglutination Test and Blood-Agglutination. Vergleichende Untersuchungen über die Serum-Agglutination und die Frischblut-Schnell agglutination bei der Diagnose und Bekämpfung der Pullorumseuche. Dr. G. Schmid. Schweizer Archiv für Tierheilkunde, T. 73, p. 163.

The experiments proved that the rapid blood test is very suitable for the reaction. In the case of 164 negative hens 99 % good results were obtained and in 83 cocks 96 %.

In the case of infected birds the blood test is more sensitive than the slow serum test. Of 255 birds found positive with the rapid blood test only 240 were found positive with the serum test and 15 negative.

The blood test appears to be less suitable for cocks.

The greatest certainty in distinguishing carriers of pullorum bacilli is obtained by applying both methods directly after each other. As the import of chickens, still carrying the first down-plumage, is prohibited in Switzerland it is advisable when importing poultry into that country to apply the rapid blood test at the frontier.

Rapid Agglutination Test. O nekim brzion aglutinacionim metodama za ustanovljenje kokosjeg tifa. Jugoslovenski veterinarski glasnik, Tome 11, p. 70. — Ref. Tierärztliche Rundschau, 1931, p. 540.

Three rapid agglutination tests were made on 610 hens for the purpose of distinguishing fowl-typhoid, in order to compare this method with slow agglutination (dilution 1 : 25).

Of 331 hens the same results were obtained by both methods in 328 cases. In 3 cases the rapid test was positive and the slow negative.

Of 142 cases in which the rapid test was made, the results in 120 cases were the same as those obtained by the slow method.

Fresh-blood Agglutination Test. Zur Anwendung der Frischblutmethode bei Pulloruminfektion in der Praxis. Peters, Gütersloh. Tierärztliche Rundschau, 1931, p. 126.

The fresh-blood agglutination test is a great improvement on the slow serum method. Although it is a relatively rough serologic reaction only 4,65 % faulty results were observed. The execution of this method calls for large experience and knowledge. It can therefore only be carried out by veterinary surgeons who have carefully studied this method. The test takes 50 seconds so that 70 birds per hour can be treated.

Accuracy of three cooperating Laboratories in detecting Pullorum Disease by the Agglutination Test. J. Biely, University of Vancouver, B. C., C. E. Sawyer and C. M. Hamilton, W. Washington Exp. Station, Puijallup, Washington. W. T. Johnson and E. M. Dickinson, Oregon Agric. Station. Corvallis, Oregon. Journal of the American Veterinary Medical Association, 1931, p. 19.

1. Fifteen negative and fifteen positive reacting fowls were produced at randow by each of the three laboratories and all surviving were bled four times at four week intervals for cooperative agglutination testing for pullorum disease.
2. Three blood samples were drawn from each fowl at each bleeding and tested at British Columbia, Washington and Oregon laboratories, each applying its own technic.
3. A total of 1041 blood samples was tested and a diagnosis made for each: 531 positives 8 suspicious and 502 negatives or a disagreement of 0.77 per cent of the 1041 diagnoses. The disagreements in agglutination test diagnoses among the laboratories were from negative or positive to suspicious and not negative to positive or the reverse.
4. One fowl changed from negative to positive but none changed from positive to negative.
5. Post mortem finding of the 46 positive reacting fowls definitely established S. Pullora infection in 44 (95.65 per cent) and characteristic lesions in the other two, indicated a probable 100 per cent S. pullora infection.
6. Post mortem findings of the 44 fowls which never gave a positive reaction were 100 per cent negative; as determined bacteriologically and by absence of S. pullora lesions.
7. All three laboratories were in absolute accord in the 342 test diagnoses of the fifteen positive and fifteen negative reacting fowls of lobartory and post mortem examinations established the positive fowls infected and the negative fowls not infected, as determined by gross and bacteriological examinations.

A serious, very international consultation!
During our visit in Rome (see Int. Review IV, 2) Dr. Bonimelli showed us the poultry-yards of the Pope. One of the cockerels, presented by Poland was suffering, so we had a consultation by (from left to right): Prof. Castelló from Spain, Dr. te Hennepe from Holland, Dr. Bonimelli and Prof. Marinucci, Italy.

(Photo by Prof. Clementi).

Opening of a poultry-course at the Agricultural School at Rome by our Vice-President Professor Castelló. In the middle of the students: Prof. Castelló, Prof. Dr. Mario Marinucci, Director of the R. Scuola Agraria Media di Roma and Dr. te Hennepe. (Report of these courses see page 13 of this copy)

(Photo by Prof. Clementi).

The Agglutination Test. Dearstyne, Greaves and Ganger. Technical Bulletin, No. 40. Agricultural Station of the North Carolina State College, April 1931.

The results of four years experimenting on intermittant reactors is described. These birds are sometimes positive reactive and at other times negative reactive. Attempts have been made to discover the cause of this. Absolutely no connection was discovered between the failing of the reaction and the condition of the hen or of the antigen. Neither have age or sex any influence.

Can adult Fowls be infected with Pullorum germs? Können sich erwachsene Hühner mit Küchenruhr infizieren? Dr. Lerche, Breslau. Bakteriologisches Institut der Landwirtschaftskammer Niederschlesien. Tierärztliche Rundschau, 1931, p. 511.

Summary:

The writer first gives a literary review of experiments with 15 hens and a cock, some of which were descended from hens infected with pullorum. The results proved that infection from infected hens to healthy hens takes place. This agrees with the experiments made by Brunett, Kernkamp, Edwards and Hull. It depends on whether there are among the positive reacting hens also virus-spreaders. The percentage of bacteria spreaders is very small. In 400 positive reacting hens Hof only found Pullorum Bacilli in the oviduct or cloaca 13 times.

Transmission of Bacterium Pullorum. Infection among Mature Chickens. Journal of the American Veterinary Medical Association, 1930, p. 667.

13 positive reacting and 12 negative reacting hens were put together with 2 non-reacting cocks but no transmission of the diseases was observed. During the nine months test period the flock remained unchanged. In another flock of 14 reacting and 14 non-reacting hens one hen became infected. There is no doubt that the infection spreads among poultry but not, however, as rapidly as is generally assumed.

Combatting Pullorum-Disease. Zur Bekämpfung der Pullorumseuche. Dr. Peters, Gütersloh. Deutsche Tierärztliche Wochenschrift, 1931, p. 225.

Peters and Wollersheim made experiments with 400 positive reacting hens. During a period of 23 months no deaths occurred among these hens, laying capacity, hatching results and the rearing of chickens were very favourable and were no worse than those of healthy control hens.

After the first test, which lasted 23 months, the birds were again under observation for 9 months. During this period it appeared that there was no spreading of virus and a probable recovery must be considered.

Of what value is the blood agglutination test if all chickens of positive reareacting hens remain healthy? The killing of the 400 hens would have caused considerable loss on the farm subjected to observation. The blood test in healthy pens causes considerable damage and is only to be advised in pens where pullorum is prevalent.

In connection with this Professors Mieszner and Berge state that in thousands of cases which they examined with an agglutination — titer of 1 in 100 —, such as Peters used in his tests, microscopical changes were repeatedly

observed, especially in the ovary. Mieszner is of the opinion therefore that the positive results of Peters are to be ascribed to pseudo-agglutination. He therefore advises that the hens should again be tested according to the rapid blood-test.

As regards this, Peters states that the 400 hens reacted positively at two different institutions. If, therefore, mistakes were made here, this is proof that the blood-agglutination test is of no value in practice.

Technic of the Blood-Agglutination-Test with the aid of the Agglutinoscope. Technik der Blutuntersuchung auf Kükenruhr mit Hilfe des Agglutinoskope für Schnellagglutinationen. Dr. Kurt Wagener, Hygienisches Institut der Tierärztlichen Hochschule Berlin. Tierärztliche Rundschau, 1931, p. 177.

An accurate description of the agglutination method by means of the rapid blood test. In order to prevent drying and to keep out the dust the writer has constructed an instrument in which the slides with the drops of blood and antigen are pushed under a glass plate. This apparatus has various advantages as compared with the one made by Steenblock.

Dangers by drawing blood from the Comb. Geflügel-Börse, 14 April, 1931.

In order to obtain blood for the purposes of blood-tests a point of the comb is often cut off with a pair of scissors. Dr. Schürmann states that this causes bleeding which often lasts for 24 hours and can quite easily be fatal. When, therefore, this method is employed it is advisable to touch the small wounds with a hot iron immediately, in order to stop the bleeding.

[To this report I (dr. te Hennepe) can add that one of our members in Sweden wrote informing me that a large number of White Leghorns on his farm bled to death after the cutting off of a point of the comb.]

Bacteriophages and Agglutinins in Fowls. Bakteriophagen und Agglutinine bei Hühnern. Dr. Kurt Marcusse. Hygienisches-Bakteriologisches Institut. Hauptgesundheitsambt der Stadt Berlin. Zentralblatt für Bakteriologie, Tome 120, 1931, p. 166.

In agreement with d'Herelle, Bail, Hodder, Kleineberger, it was observed that bacteriophages often occur in fowl manure especially against the pseudo-dysenteria group.

In poultry-serum agglutinins against dysentery are often found. The agglutinins are probably caused by unspecific protein changes.

Pullorum Disease in Denmark. C. O. Jensen. Maanedskrift for Dyrlaeger, 1930, p. 341.

During the period between February 1928 and 30th April 1930 767 flocks have been examined for pullorum. Of these 473 appeared to be free and 291, or 37,9 %, were infected.

131.387 hens were submitted to the blood-test of which 6571 or 5 % were positive and 778, about 0,6 % showed a doubtful reaction.

Of 291 flocks 185 had to 10 % reactors, 48 had from 10 %—25 % reactors and 58 had more than 25 % reactors.

The spread of the disease is about the same in all provinces.

Storage of Fowl-blood for serologic purposes. A baromfiver konzervalasa oz agglutinatios proba vergrehajtasa celjabal. E. Simontsits. (Ref. Berliner Tierärztliche Wochenschrift, 1931, p. 361).

Blood can be stored with a 0,5 % solution of carbolic acid. Boric-acid is however better as the agglutination is less affected by this. The best way is to mix the blood with 1 in 50 to 100 boric-acid, thus a stronger solution than recommended by A. H. Baker (1 : 500).

Sterilisation of Eggs containing Pullorum-Germs. Die Sterilisation der Eier, die mit Salmonella pullorum infiziert sind. R. P. Tittsler. Münchener Tierärztliche Wochenschrift, 1930, p. 298.

At a poultry farm at which the rejected eggs were fed to the hens 75 % of the hens reacted to B. pullorum. It is advisable to boil the eggs for five minutes before use.

TUBERCULOSIS

Fowl Tuberculosis and Tuberculosis of Mammals. Die Geflügeltuberkulose und ihre Beziehungen zur Säugetiertuberkulose. Dr. Ruth Pallaske-Eber. Deutsche Tierärztliche Wochenschrift, 1931, p. 1.

From a literary review it seems that the eggs of tuberculous poultry plays a secondary role as a source of infection for chickens and human beings.

It is now generally assumed that the avian tuberculosis bacil is a type peculair to birds.

Richters was able to infect a number of hens with a pure culture of human tubercle bacilli but Zschenitz was unsuccessful with this experiment. The writer succeeded in causing in a few cases insignificant local processes in birds, with human and bovine tubercle bacilli.Mammal bacilli play practically no part at present in spontaneous fowl tuberculosis. Infection of parrots and canaries with mammal bacilli is easier.

Humans and mammals appear to be sensitive to fowl bacilli. Pigs, especially, are often infected.

Sensitiviness for Tuberculosis. Die Empfänglichkeit des Hühnes für Tuberkulose unter normalen Haltungsbedingungen. Beller and Henninger. Archiv für Geflügelkunde, 1930, p. 453.

It is only when large quantities of tubercle bacilli are fed that these remain present in the body and even this must be done repeatedly. Even though the bacilli remain in the body it is still uncertain whether tuberculous changes will take place. The tuberculine reaction does, however, become positive. Birds are not very sensitive to mammal tubercle bacilli. It was only by administering large doses of mammal bacilli that it was possible to awaken symptoms of disease in three birds.

Of 620 eggs from 30 hens on an infected farm only 2 or $^1/_3$ % appeared to be infected.

Tuberculosis of Man and Animals. H. H. Scott. His Majesty's stationery Office, Adastral House, Kingsway, London. W.C. 2.

Description of tuberculosis in man and various animals i.a. wild and tame birds.

Various clinic, anatomic-pathologic and bacteriologic data are described.

Possibility of the infection of poultry with tuberculosis by human beings. Ueber die Möglichkeit der tuberkulöse Ansteckung des Huhnes vom Menschen aus. R. Rossini, La Nuova Vet. (Ref. Tijdschrift voor Diergeneeskunde, 1931, p. 374).

Success attended experiments to transmit tuberculosis from human beings to poultry. The organ-changes of this tuberculosis, experimentally transmitted from human beings to poultry, are very often only observable through the microscope. A negative tuberculine-reaction in the hen excludes only active centre: latent centres may, in spite of this, still exist. This might explain why tuberculine-reaction under certain circumstances agrees but to a certain extent with the post-mortem results.

The bone-marrow of the hen makes good material for showing as well as for the culture of Koch bacilli.

Chronic Infection of the Udder of a Goat with Avian Tubercle Bacilli. A. Stanley Griffith. Pathological Department, Field Laboratories. University of Cambridge. The Journal of Comparative Pathology and Therapeutics, 1931, Tome 44, part. 2, p. 144.

In December 1927 author reported the finding of avian tubercle bacilli in the milk of two goats which sometime previously had been inoculated subcutaneously with cultures of avian bacilli.

One goat was killed 320 days after inoculation. The second goat, the subject of this report, was inoculated subcutaneously on March 10th, 1926 with 100 m.gr. of an avian strain and is still alive and well.

The kids born from this goat showed no sign of infection, although they must have ingested with the milk several thousand avian bacilli. During a period of more than 4½ years avian bacilli have maintained themselves in the right half of the udder and have from time to time been recovered in pure culture from the milk. The source of the bacilli in the udder is obscure, the goat reacts well to avian tuberculin. There is as yet no evidence of a progressive lesion or of destruction of the mammarygland tissue. The bacilli have retained their characteristics after a stage of 5 years in the goat.

The Pathogenicity for Dogs of Bacilli of Avian Tuberculosis. W. H. Feldman. Journal of the American Veterinary medical Association, 1930, p. 309.

Up to the present no cases have been discovered of the infection of dogs with Avian tubercle bacilli. The writer has made several experiments on dogs. The dogs proved unsusceptible for infection by feeding.

The bacilli passed through the intestines but remained virulent for fowl. Both intraperitoneal and intrabronchial infection were unsuccesful. Intravenous infection only caused specific changes in the liver. In one dog the bacilli were ejected by the kidneys.

In the case of 6 dogs results were obtained by intracerebral infection. It caused changes in the brain and the liver, but not in the lungs. After an incubation period of 10—14 days the disease proved fatal in 6—14 days.

Immunisation of Pigeons with Calmette-Vaccin. F. Palec. (Ref. Zentralblatt für Bakteriologie, T. 102, 1931, p. 325).

The pigeons were treated with avian tubercle bacilli, which had been cultivated on potatoes for 125 generations and afterwards boiled in bovine bile with 5 % glycerine. The vaccine was carried well in a quantity of 2 m.gr.

Under control, pigeons died of an infection with 0,1—2 m.gr. of avian tubercle bacilli.

DIPHTHERIA

Combatting Diphtheria. Bekämpfung der Geflügelpocken. Prof. Mieszner. Deutsche Tierärztliche Wochenschrift, 1931, p. 395.

A meeting of poultry scientists and veterinarians took place at the Prussian Ministry of Agriculture. A discussion was held concerning the causes of the unfavourable results with vaccines in 1930. It appeared that the disease had been prevalent in a very rabid form and that many cases were succeeded by contagious roup. The powers of resistance are considerably weakened by roup. The vaccines prepared by various institutes were similar in their action. All these institutes are under State Control. On account of the attendant danger inoculation by laymen is forbidden.

Combatting Diphtheria. Ueber Geflügeldiphtherie, Geflügelpocken und die Immunisation gegen diese Krankheit. Dr. T. van Heelsbergen, Utrecht. Tierärztliche Rundschau, 1931, p. 492.

The following are described: Symptoms, Diagnosis, Cause, Spreading the Disease, Vaccination.

During the last 10 years the following methods have been recommended: A. Vaccination with dead virus. This method did not give sufficient immunity. B. Vaccination with living virus according to Johnson and Beach. This method is dangerous as it sometimes causes strong reaction. C. Vaccination with living pigeon pox virus. This method does give immunity but the degree and period of the immunity is not yet sufficiently known. D. Vaccination with fowl-virus after passage by pigeons. E. Vaccination with anti-diphtherine. The principle of this vaccine is also based on the change in fowl-virus after passage by another species of animal. After eight years experience it appears that this method gives sufficient immunity.

Comparative Study of Various Kinds of Animal Pox. Contribution à l'étude comparative de diverses varioles animales. J. Lahaye, Annales de Medecine Vétérinaire. Dec. 1930.

Already in 1927 Lahaye came to the conclusion that there is a great difference between Jenner's vaccine, cow-pox vaccine and the virus which causes fowl-pox. In 1928 he proved that the virus of fowl-pox is not the same as that which causes pigeon-pox. In 1929 he observed pox (diphtheria) in a canary in which it appeared that the virus in this case was identical neither with fowl-virus nor pigeon-virus. This last publication gives the results of new experiments. The following are some of the conclusions obtained from these experiments,

The virus of hens, turkeys and guinea fowl appears to be of one sort. It is not virulent for pigeons nor for finchlike birds.

Pigeon-virus is virulent for pigeons and hens but not for finchlike birds. Hens get a local attack. The virus of canaries and finches appear to be similar. The writer calles this „le virus des passereaux", sparrow-virus. Pigeons and hens are not sensitive to this virus. Pigeon-virus is not identical with vaccine. Fowl-virus cannot be cultivated in cattle: cattle vaccinated with this are still sensitive to vaccine. Fowl, inoculated with vaccine, remain absolutely sensitive to fowl-pox. Fowl-virus does not grow in rabbit organism and after treatment with this virus rabbits still remain sensitive to vaccine. According to similar experiments sparrow-virus is also different to vaccine.

The general conclusions are therefore these, that the various kinds of avian-pox-virus are in no way identical with Jenner's cow-pox vaccine; and that up to the present there are known to be three different kinds of virus of avian pox which has each for itself affinity for a certain group of birds.

Transmission of Fowl-Pox by Mosquitos. I. J. Kliger en M. Ashner. Exp. Path. 10. (Ref. Archives of Pathology, Volume 10, No. 1. Tijdschrift voor Diergeneeskunde, Mei, 1931).

Mosquitos transmit fowl-pox from infected to healthy birds. During a period of at last sixteen days the same infected insect can cause a number of successive infections. The taking of food from another class of animal does not reduce the infecting capacity of the insect. The virus appears to be located on the proboscis. Infection can take place by puncture with the proboscis from 16 to 19 days, after the insect has become infected, but seldom occurs through inoculation of any other part of the body of the insect. The virus of fowl-pox attaches itself in the same manner to silver pens as to the proboscis of the insect. The possibility of purely mechanical transmission of the virus must be still further investigated.

Results of Experiments with the use of Pigeon-Pox Virus as cutaneous Vaccine against Fowl-Pox. E. P. Johnson, Blacksburg, Va. Agricultural Experiment Station. Journal of the American Veterinary Medical Association, 1931, p. 81.

After the application of the virus in the skin of pigeons, scabs usually develop sufficiently in 12 to 14 days. These scabs are then removed either with a scalpel or a small curette, and collected in a tared Petri dish. This pulp is then ground in a mortar with the addition of ten parts of diluted glycerin, consisting of equal amounts of glycerin and distilled water. After grinding, this material is filtered through gauze and the vaccine is stored in a refrigerator until it is used.

Conclusions. Pigeon-pox virus vaccine, prepared as described, is a very satisfactory immunizing agent for preventing material infection of chicken-pox.

This product was not 100 per cent efficient in immunizing against artificial infection.

Pigeon-pox virus vaccine seems to have no ill effects upon the birds, nor was any decrease noted in egg-production following its use.

Immunisation against Fowl Pox. Morcos. The Veterinary Record, 25 April 1931.

The blood of infected hens and pigeons is virulent. Avian virus is non-pathogenic for guinea-pigs and white rats.

A virulent emulsion of pigeon-virus mixed with 1 : 500 formaline protects both hens and pigeons.

Testing Fowl-Pox Vaccin. Auswertung von Geflügelpocken virus. E. Gildemeister and K. Beller. Bakteriologische Abteilung des Reichsgesundheitsamts. Berlin-Dahlem. Zentralblatt für Bakteriologie, T. 121, 1931, p. 313.

The description of a method of determining the strength of pox-vaccin by an intracutaneous inocculation of decreasing quantities of vaccin on the inside of the wattle of hens.

This method was also applied with vaccins against fowl-pox which had not been prepared from fowl-virus. The results were favourable so that the method can also be used for the vaccins already on sale.

CHOLERA — TYPHOID

Vaccination against Cholera. Vaccination contre le Choléra aviaire. Miss G. Cordier. Laboratoires de l'Institut Arloing. Tunis. Comptes Rendus de la Société de Biologie, Tome 107, 1931, p. 129.

During the last two years cholera has occasioned considerable damage in Tunis.

Two vaccines have been prepared which are injected 8 to 9 days after each other.

The first consists of pasteurella germs of the rabbit of which the living culture is used in a dose of 0,1 c.c.m. Later the first vaccine was made from avian-cholera-germs which were cultivated in broth with 5 % bile.

The second vaccin consists of live germs which are cultivated in bile-broth during 13 to 15 passages.

The vaccination caused a cessation of the disease on infected farms. It appears therefore that cholera can be efficiently combatted with living cultures.

Pasteurella avicida in rotting Carcasses. Conservation de la Pasteurella avicida sur des cadavres en décomposition. J. Reis. Comptes rendus de la Société de Biologie, Tome 107, 1931, p. 648.

The writer examined a number of carcases which he had buried at a depth of 50 c.m. and dug up at regular intervals.

Up to the 11th day the cholera-bacilli could only be observed by vaccination of other test animals, hens, rabbits or guinea-pigs. After the 11th day they could not, in general, be observed.

Determination of Cholera-Bacilli in saccharose containing media. A Pasteurella aviseptica kimutatása saccharosét tartalmazó agartalajon. J. Vlád. Budapest. Berliner Tierärztliche Wochenschrift, 1931, p. 376.

The litmus-saccharose-agar according to Manninger is extremely suitable for a quick diagnosis of cholera-bacilli and other bacilli. Fowl-cholera bacilli develops red colonies on this medium while the Klein Bacilli and Bac. Breslaviense form blue colonies. Cholera-bacilli form blue colonies on Drigalski agar,

Pigeons as carriers of Bact. Enteritidis Breslaviense. Tauben als Ausscheider von Bacterium enteritidis breslaviense. G. Schütt. Hygienisches Institut der Tierärztliche Hochschule, Hannover. Deutsche Tierärztliche Wochenschrift, 1931, p. 401.

Conclusions:

1. Among 120 healthy pigeons 8 = 6,6 % carriers of Bact. Breslaviense were found.
2. Two pigeons had a titer of 1 : 200, five one of 1 : 100 and one of 1 : 50.
3. Of the eight positive reactionary pigeons five gave bacilli permanently off and three periodically.
4. Post-mortem examination showed small spleen and liver swelling in the eight pigeons. In two pigeons small white points were found in the liver. The mucous membrane of the intestine was somewhat swollen.
5. In 7 pigeons Bact. Breslaviense were found in the heart, liver, spleen, kidneys and intestines. In one pigeon only in the liver and intestines.
6. The disease must be combatted by killing off the infected birds.
7. Agglutination is the best method for distinguishing sick from healthy birds. An dilution of 1 : 50 can be looked upon as a positive titer.

Paratyphoid Infection of Pigeons. Brunett. Cornell Veterinarian, 1930, p. 169.

Report of the repeated occurrence of wing-paralysis and joint-diseases on a farm of 8000 head. The cause appeared to be B. paratyphoid Breslau. The ovaries also often showed alterations. Treatment remained unsuccessful.

The action of various disinfectants on Bacillus Gallinarum and Pasteurella Aviseptica. Különböző fertötlenitö szerek hatása a Bacillus gallinarum és a Pasteurella avisepticára. A. Barta. Berliner Tierärztliche Wochenschrift, 1931, p. 376.

Various disinfectants were tried. The best appeared to be natron-lye. With a ½ % solution both bacteria were killed within one minute. This method is also employed in Hungary.

Wattle Disease in Palestine. Y. S. Grasovsky, Assistant Veterinary Officer, Afuleh. The Veterinary Journal, 1931, p. 336.

An outbreak of wattle disease appeared suddenly among a flock of White Leghorns on a farm in the Valley of Israel. In forty out of sixty odd cases there was conjunctivitis and the swelling of the wattles extended to the region of the eyes.

Wattle disease is caused by the bacillus of fowl cholera. Of the sixty cases mentioned, not one died. No special treatment was applied, as the birds recovered without treatment quite rapidly.

CONTAGIOUS ABORTION

Transmission of Brucella Bang by Birds. Des possibilités de transmission de la Fièvre ondulante par les oiseaux. H. Violle. Bulletin de l'Académie de médecine, 10 Febr., 1931. (Ref. Revue Générale de Méd. Vétérinaire, Tome 40, 1931, p. 348).

Pigeons, finches and blackbirds are susceptible to infection with Brucella abortus. The infected birds either die of the disease or become carriers of virus. Birds can therefore play a part in the spreading of the disease.

Bacterium abortus infection of the Fowl. H. L. Gilman and E. L. Brunett. Cornell Veterinarian, Tome 20, p. 371.

From samples of blood it was found that in the State of New York of 1885 birds 89 reacted to Bact. abortus. In experiments with naturally infected milk and bacteria a positive reaction of the blood was caused by subcutaneous, intraperitonal or feeding infection. In some cases the bacteria were still found in the infected hens after 98 and 138 days. Hens appear to be more sensitive for strains from hens. A higher blood titer can be caused in hens when they are fed on milk. Disturbances in the health and decrease of laying capacity were not noticed.

Are Chickens susceptible to contagious Abortion. C. R. Strange and B. A. Beach. Veterinary medicine, 1931, p. 4.

The writers made experiments in connection with the infecting of hens. 32 hens of from 5 to 6 months old were used. They were infected with cultures from cattle and pigs, with naturally infected milk, with material from abortively born calves and rabbits. In three to four months no disease changes were observed. The number of positive reactors was increased by subcutaneous or intravenous injections. Bacteriologic examinations of the slaughtered birds showed no abortus bacilli in liver, spleen, testes and ovaries. Vaccinated guinea-pigs also remained negative.

PARALYSIS

Studies on Fowl Paralysis. Part I. Dr. O. Emoto and K. Miyamoto. Laboratory of animal Pathology and Bacteriology, Faculty of Agriculture. Tokio Imperial University. Journal of the Japanese Society of Veterinary Science, 1930, p. 309.

Conclusions:

1. This is a particular disease which without any special cause produces asymmetrical, partial and progressive paralysis of the wing and leg or contraction of pupil and grey discoloration of iris with blindness.
2. All of the chief breeds of fowl are affected by this disease. As regards the age incidence ,they are the most frequently affected when they are about one year old.
3. This disease has nothing to do with the food and the appetite remains almost unchanged from beginning to end. Spontaneous recovery may very rarely occur.
4. The principal pathological changes are situated in the nervous system and eye. The essential feature of these tissues in the earlier stage is an intense infiltration of lymphoid and large mononuclears mixed up with easinophilic cells. This is accompanied by myelin degeneration and gradual atrophy of the ground tissue. In the chronic instances, the affected nervous system and eye show connective tissue proliferation. The primary cerebrospinal affection is not observed and usually lesions of the iris and periphery nerves appear to take place first and then they will spread to the central nervous system. The pathologiy of this disease, of course, strongly suggests that it is infectious in nature.

5. The disease was not at all in prevalence in Japan until 2 or 3 years ago but was imported together with imported animals. In the farm where affected animals have once appeared, this disease occurs every year afterwards. Not only the imported animals and their offsprings but also ordinary hens of our country have come to be affected by this disease, i.e., this disease can be also considered from its epidemiology to be an infectious disease.
6. Coccidia and other intestinal worms can not be considered as the true causative agent of this disease in our country.

OTHER CONTAGIOUS DISEASES

Tuberculosis, Pocks, Diarrhea and Coccidiosis of Poultry. Tuberkulose, Pocken, Ruhr und Kokzidiose des Geflügels. Dr. Lerche, Breslau. Tierärztliche Rundschau, 1931, p. 147, 212, 254.

The literature concerning these diseases has become so extensive that it is almost impossible to review. The writer has therefore collected data regarding the above diseases so that readers can obtain a quicker insight. The principle facts from the years 1928—1930 are given.

The abovementioned articles give a review of tuberculosis, pox, pullorum and coccidiosis.

Ultra-violet Rays and Diseases. Ist der bakteriziden Eigenschaft der ultrivioletten Strahlen besonders in der Geflügelzucht eine praktische Bedeutung bei zu messen? W. Hundhammer. Tierärztliche Rundschau, 1930, p. 157.

After three hours treatment ultra-violet rays did not kill the following germs:— Bact. pull., Bact. avisepticum, Bact. parathyphi, Bact. coli. Neither has the ozone caused by this any effect. The rays penetrate sand only to a depth of 1½ mm. and straw-cuttings to a depth of only ½—1 cm.

Contagious Cloacitis in Fowls-Sulla cloacite, enzo otica dei polli. V. Pagnini. La Clinica veterinaria, 1930, p. 777.

The inflammation of the mucous membrane is catharal or ulcerous. It is occasioned by trauma (swelling of the cloaca, breaking of eggs, copulation). Disturbances in the nitrogen-balance (urea) is also presumed to be a cause. The course of the disease is generally chronic and through peritonitis can be fatal.

Experiments to transmit the disease fail. Neither could the cock transmit the disease.

Chemical examination proved that no uraemia existed in the sick hens. Irrigation with a 0,1 % Potassium Permaganate of Boric Acid resulted in a rapid cure. The real cause of the disease has therefore not been found.

Bacteriae Flora in Feces of the normal Fowl. M. W. Emmel. Journal of infectious Diseases, 1930, p. 293.

20 hens and 10 chickens were examined. Escherichia coli and Esch. communior were chiefly found. In two chickens Aerobacter aerogenes were found. Bacterioides liquifaciens was also found. Esch. coli and Esch. communior were also in the majority of the hens. In 8 hens staphylococcus citreus was found. Of the anaerobes, Bacterioides lipilus and Clostridium sporogenes were present.

In two birds Aero bacter aerogenes was found. Esch. coli and Esch. communior appear to retard the invasion and increase of pathogene organisms.

Cure of Malaria in Canaries. Ueber Heilversuche am Malaria infizierten Kanarienvogel mit einem neuen Präparat. Dr. W. A. Collier, Dr. A. Warstadt, Magdalene Krause. Institut für Infektionskrankheiten, Robert Koch, Berlin. Zeitschrift für Hygiene und Infektionskrankheiten. T. 112, 1931, p. 527.

The writers examined the action of a Chinolin preparation. It appeared to be very active both as a prevention and a cure. In rabbits it appeared to be relatively harmless. It does not form methaemoglobin either in human or animal bodies.

Leucaemia in Canary-birds. Leucaemia Kanárimadarbon. L. Farkas. Allatorvosi Lapok, Tome 53, p. 226. (Ref. Berliner Tierärztliche Wochenschrift, 1931, p. 428).

Extra vascular lymphatic Leucosis was discovered in a canary. The liver weighed 2 grams, was of an ochre yellow colour and contained various grey points. The spleen weighed 1 gram, was 15 mm. long and covered with many grey points. Many leucocytes appeared in the blood preparations.

The Action of „710" Fourneau against Malaria. Etude de l'Action du 710 Fourneau sur le Paludisme des Oiseaux a Plasmodium Relictum. (Note Préliminaire). Edm. and Et. Sergent, A. Cataneï, F. Frensz and A. Sergent, Institut Pasteur d'Algérie. Annales de l'Institut Pasteur, 1931, p. 57.

Conclusions:

For the purpose of investigating the action of „710" Fourneau it was compared with the action of quinine. 553 canaries were used for these experiments. It appeared that „710" Fourneau opposes the development of Plasmodium Relictum, both curatively and preventively and causes profound changes in this parasite.

The efficiency agrees with that of quinine.

Infectious Poultry Diseases. Prof. P. W. Sisoff, Moscou. St. Lublino, U. S. S. R. Institute of Veterinary Research. 1931.

Contents:

Preface. Cholera. Fowl-pest. Fowl-typhoid. Pullorum Disease. Fowl-pox. Tuberculosis. Table for Diagnosis of Cholera, Pest and Typhoid. Diagnosis in the field and in the laboratory. (The book is published in Russian language and Russian characters).

A Laryngotracheitis Syndrome in wild Goose associated with Pneumomycosis. R. Graham and F. Thorp. Laboratory of Animal Pathology and Hygiene, University of Illinois, Urbana, Illinois. Journal of the American Veterinary Medical Association, 1931, p. 90.

Summary:

A laryngotracheitis syndrome in a wild goose, associated with gross exudative lesions of the respiratory tract and mild congestion of the lungs, proved to be a mycotic pneumonia. The mycosis was not communicated by direct swab of the larynx and trachea or by sterile filtrates prepared from the exudate in the respiratory tract when administered to healthy chicks one month of age.

On the poisonous substances in liver bouillon culture of the anaerobic bacillus isolated from the chicken-diarrhea. Akio Iizuka. The Veterinary Laboratory, Ministry of Agriculture and Forestery, Nishigahara, Tokyo. Journal of the Japanese Society of Veterinary Science, 1930, p. 159.

The followings are the conclusions of the study of the poisonous substances produced by the anaerobic bacillus isolated from the chicken-diarrhea by N. Nakamura.

1. Liver bouillon culture of the bacillus contains at least two poisonous substances, and one is thermolabile and the other thermostabile.
2. The thermolabile substance is too unstable for physical and chemical treatments, so its chemical nature remains quite undetermined.
3. This poison causes, when injected to pigeons and fowls intravenously or intraperitoneally, the rise of the uric acid level in blood in a few hours, and in severe cases the amount of the acid reaches several times larger concentration than the normal accompanied by the death of birds.
4. The immunization experiment proves that this poison has no antigenic property.
5. The amount of uric acid in blood and liver of the chicks dead from chicken-diarrhea is always much larger than the normal. So this thermolabile poison may have some bearings with the pathogenic factors of the chicken-diarrhea, though the rise of uric acid level is not specific in this disease, the same thing being found in the later stage of B-avitaminosis.
6. The thermostabile substance can be extracted with amyl alcohol under strong alkaline reaction (method of Hanke and Koessler) from the culture of this bacillus, and can be purified as picrate.
7. Date obtained from determination of melting point, elemental analysis and toxicity to the guinea pig shows that this picrate is histamine dipicrate.
8. This bacillus can produce histamine not only from liver bouillon in a few days (1—3 days), but also from histidine added to the bouillon.

PARASITES

Practical Experience in Combatting Syngamose in Fowls. Practische Erfahrungen in der Bekämpfung der Syngamose des Geflügels Dr. Lerche, Berl. Tierärztl. Wochenschr. No. 48, 1930.

Syngamus trachea has its seat in the trachea of hens, turkeys, pheasants and a large number of wild birds. The female worms in continual copulation with the male worms throw off large quantities of eggs which are conducted to the oral cavity by means of the trachea slime of the hosts and finally leave the body of the bird with the faeces. If there is a suitable degree of humidity and a sufficient supply of oxygen larvae develop in these eggs in from 5—7 days which, if taken up with the food will cause a new invasion.

Young birds are especially susceptible. There is great difficulty in breathing and a large number fall victims to the disease.

It is a well known fact that parasite-carriers occur among pheasants. It often happens that seemingly good pheasants are bought which however have the little red worm in their trachea with the result that the whole flock is attacked.

The larvae have great powers of resistance against all kinds of influences (the writer has kept them 13½ months without their losing their power of infection). It is also a known fact that a flock of hens has quickly become infected again after being run on a meadow which has lain fallow for a year.

The larvae cannot stand drying out. The writer tried some remedies as therapeuticum i.a. „Tracheolyt" an iodine preparation, of which, with the help of a syringe 0,1 to 0,5 cc. was injected via the beak through the larynx directly into the trachea. The writer used a 1 c.c. record syringe with a bent blunt canule. This remedy worked excellently.

A iodine-iodine-kali solution (about 1 : 20) was also used successfully for combatting these parasites.

In all probability the question will be asked: „Is syngamose really as significant as is supposed?" The writer answers this question by indicating the fact that syngamose is spreading. It is fortunate that we now have an active remedy in Iodine.

Worms in Poultry. Teniasi dei polli con speciale riquardo ad una forma parassitaria grave in un pollaio. La nuova Veterinaria, 1929, p. 77; no. 3, p. 21, 107, no. 4, p. 19.

The disease only appears when there are many worms in the intestines. The birds become anaemic. The writer gives a review of the kinds appearing in poultry.

In a case where 20 hens died, tape-worms were found together with Heterakis inflexa and H. papillosa. The tape-worms are always found in the small intestines and the other in the top part of the large intestine. 1 gram Kamala per bird was given as treatment.

Worm-Diseases in Fowls. Bedeutung und Behandlung der Spulwurmkrankheit bei Hühnern. Dr. J. v. Mócsy, Tierärztliche Hochschule, Budapest. Deutsche Tierärztliche Wochenschrift, 1931, p. 177.

Detailed description of the composition of fowl faeces and the examination for worm eggs by the glycerine method of Vajda.

Ascarina lineata, which is most frequent, lives in the middle part of the intestine. 4—5 ascarides in small chickens and 15—20 in bigger fowls are capable of causing death. A small number of parasites causes loss in body weight and decrease of the laying capacity.

Heterakis papillosa differs from Ascaris both in shape and manner of living. They live in the caeca where they cause catarrh and disturbance in the digestion of cellulose.

Various remedies were examined. The action of tobacco-dust is very unreliable. Seventeen other kinds of remedies against worms showed very little result. A total of 169 tests with all kinds of remedies were made. Aralban proved to be the best remedy and acted favourably on 300 hens.

Nematodes in Birds. Nematodes du genre Eucoleus Duj. 1845, chez les oiseaux. Z. Wassilkova and L. Gouchanskaja. Anales de parasitologie humaine et comparée, Tome 8, p. 619.

These nematodes occur not only in mammals but also in birds. Two new species are described from the oesophagus of Corvides and Larides, Eucoleus corvicola Wassilkowa 1930 and E. Laricola Wass. 1930.

The species, up to the present described as Capillaria Strumosa Reibisch 1893 from Phasianus colchicus and Gallus gallus were also found in the gizzard and oesophagus of Lyrurus tetrix, and also placed under species Eucoleus.

Ataxia cerebralis in Geese through Hymenolepis lanceolata. Mozjetschkowaja ataksia u gusei, kah rezultat inwasii Hymenolepis lanceolata. C. Emez. Westrik socorem. Weterin. Tome 5, p. 551. (Ref. Berliner Tierärztliche Wochenschrift, 1931, p. 320.)

Many cases of death occurred among geese. The birds showed nervous symptoms. They stretched their legs forward, sat on their tails and threw their heads and necks backward or moved them regularly to and for like the pendlum of a clock. Finally they fell on their sides. Post-mortem examination showed that the intestines contained numerous tape worms of the species Hymenolepis Lanceolata. After dosing with Kamala the symptoms disappeared. The cause of the disease was thus the toxine action of the tapeworms.

Stomach Worm Disease caused by Strongylus Nodularis. Die durch Stronglylus nodularis hervorgerufene Magenwurmseuche der Gänse. Dr. Schumann. Berl. Tierärztl. Woch., No. 48, 1930.

Stomach worm disease and other „rearing diseases" are frequent in Silicia.

The parasite is a yellowish-grey, wirelike worm about 15 mm. long. It is taken up as larvae, penetrates the mucous membrane of the gizzard into the propria. If the epithel layer is removed from this stomach the worms can be seen in a serous-bloody mass. The mucous membrane of the stomach is slightly inflamed. The young geese probably die as a result of toxine action.

The writer studied the development of the parasite. The development in the egg takes place outside the host. After 2—5 days the larvae creep out of the egg. The larvae remain mobile for at least a month. It was possible to kill the eggs with water at 70°. The larvae have great resisting power and can even stand boiling water. Stronger disinfectants and drying out killed the larvae.

The eggs and larvae are found especially in the water in which the geese swim, it is very difficult to kill them there. The only effective method is the draining of the ponds.

As therapeuticum for the affected geese tetra-chloride-carbon in 1 cc. gelatine capsules was an excellent remedy, such as was already indicated by Schmidt of the Nöller's Institute at Berlin.

Harmful Results consequent on treatment with Sodium-fluoride Ointment. Schädigungen von Hühnern durch Behandlung mit Natriumfluorid salbe anläszlich der Vertreibung von Federlingen. Dr. Neumüller. Tierseuchenstelle der Thüringer Landesanstalt für Viehversicherung. Deutsche Tierärztliche Wochenschrift, 1931, p. 166.

In the „Handbuch der Geflügelkrankheiten" (Handbook of Poultry diseases) by van Heelsbergen, Baudet advises that the feathers of the affected birds be treated with 30 % Sodium-fluoride. The writer did not obtain good results with this ointment. In one case the owner rubbed the ointment into the skin instead of the feathers and 28 hens died as a result. Extensive necrosis developed on the places treated and for days the owner had a very unpleasant pricking sensation in his fingers which made it impossible for him to write.

Combatting Parasites. Versuche zur Ungeziefer bekämpfung beim Geflügel. Zunker. Archiv für Geflügelkunde, 1930, p. 463.

The writer examined two preparations, Morsil and Aparasit. Morsil appeared to be insufficiently active and Aparasit greatly resembles Fluor-natrium. It has the advantage of being easily used. Carbolineum remains the only rational remedy for Dermanyssus.

On a new parasitic Nematode (Eustrongylides Tricolor sp. nov.) in the Proventriculus of Formosan domestic Duck. Masaatsu Sugimoto. Veterinary Laboratory, Taihoku Imperial University, Formosa, Japan. Journal of the Japanese Society of Veterinary Science, 1931, p. 66.

Twenty-two specimens of both sexes were collected from tubercles in the proventriculus of domestic duck at Taihoku, January, 1931.

Author gives an exact description with illustrations of these worms.

Capillaria annulata in Hungarian Partridges, C. M. Hamilton, Western Washington Experiment Station, Puyallup, Washington. Journal of the American Veterinary Medical Association, 1931, p. 865.

In three partridges, one recently imported from Hungary, Capillaria annulata was found. Cram reports finding this parasite in turkeys, chickens and ruffed grouse and states that the parasite is apparently widespread in this country. Author concludes: From the examination of these partridges it would appear that Capillaria annulata is a rather common parasite of this fowl and when present in large numbers will cause enough damage to the tissue of the esophagus and crop to cause death in the infested fowl.

COCCIDIOSIS

Studies in the Pathology of Avian Coccidiosis, H. J. Stafseth, East Lansing, Mich. Michigan State College. Journal of the American Veterinary Medical Association, 1931, p. 793.

Summary:

Coccidiosis in young chicks usually has its seat in the ceca and lower portion of the small intestines. The gross pathological changes are various degrees of hemorrhage and formation of more or less blood stained, cheesy material in the ceca. Microscopically one sees: destruction of epithelium of the villi and gland tubules and sloughing of the mucous membrane. The cecal contents consist of tissue debris, necrotic material blood cells and coccidia.

In birds over eight weeks of age one usually finds that the ceca are

very seldom visibly affected. Duodenal infection is most common and the other parts of the small intestines may be involved at times.

The gross pathological changes are: Thickening of the intestinal canal in the early stages and shrinking after sloughing of mucous membrane has taken place. Colonies of coccidia may appear as grayish spots or streaks on the mucous membrane, some times visible through the serous coat. There may be hemorrhages, dirty mucous exudate, ulcus and diphtheritic membrane. Microscopically we find that some coccidia seem to do little damage, infecting only single cells here and there.

Others infect extentive areas of epithelium, causing desquamation, some infect glandular epithelium as well as villous epithelium causing desquamation, of both, and again we have those which cause „subepithelial" infection and produce sloughing of the mucous membranes. It appears from this study that there are several species of coccidia, the Eimeria tenella and the E. acervulina having been quite definitely recognized.

Areas of infiltration with undifferentiated mesenchymal cells occurred frequently in the liver of infected chickens and always around the foci of infection found in the stroma mucosae.

Many such areas were found showing no coccidia but it can not be stated with any degree of assurance that they always represent lesions of a more or less recent coccidiosis infection.

Leg weakness and paralysis occur more frequently in connection with duodenal than cecal coccidiosis.

Coccidia morphologically indistinguishable from some of those found in chickens were found in pigeons showing leg weakness.

Coccidia were not found in the livers of infected chickens.

No evidence was found to show that sparrows carry the Eimeria.

A Contribution to the Epizootology of avian Coccidiosis. D. C. Matheson. Indian Veterinary Journal, Tome 7, p. 131.

Of 1426 fowls examined in Edinburgh coccidiosis was found in 7,5 %. Of the adults birds 0,7 % were infected and of the chickens 6,7 %. The disease was also found in chickens of 7—14 days old. On two farms, 1094 fowls were examined and 5,7 % proved to be coccidi-carriers.

Fowl-Coccidiosis. Les Coccidiosis aviaires. I. Verge. Receuil de Médécine Vétérinaire, Tome 107, p. 65.

The writer gives a summary of the literature dealing with this. It is proved that the curatives are not very efficient. Hygien is the principle factor in combatting. Chemical disinfectants are in general not suitable for killing ooccysts, but favour development by killing the parasites harmful to the ooccysts.

Coccidiosis in Russia. Coccidiose des Poussins en Russie. Yakimoff et Rastégaieff. Bulletin de la Société de Pathologie exotique, Juillet 1930. Ref. Recueil de Méd. Vét. de l'Ecole d'Alfort, 1931, p. 426.)

Examination of the faeces reveals three forms of coccidis. Eimeria tenella is especially prevalent. Ichtargon is a good curative for the disease.

The new Poultry Pathological Research Laboratories, Goring, England.
Opened July 23rd by Sir Edward Brown.

Dr. Hamilton and his staff of the new Poultry Pathological Research Laboratory, Goring, England. (See page 34 of this copy).

TUMORS

Tumors in Intestine of Hen. Fibronia molle dell' intestino tenue di un pollo. F. Pistelli. La Nuova Veterinaria, 1930, p. 339. (Ref. Deutsche Tierärztliche Wochenschrift, 1931, p. 333.)

Three round tumors with short stalks were found on the intestines. One was as large as a hen egg.They were soft. The tumor contained many blood vessels and muscle fibres and connective-tissue cells. Tumors were also present in the serosa. Microscopic examination pointed to a fibrome.

Contagious Haemangiosarcomatosis in Fowls. Haemangiosarcomatosis jarvanyszerü elöfordulasa madaraknal. J. Sal. Allatorvosi Lapok, 1930, Tome 53, p. 144. (Ref. Berliner Tierärztliche Wochenschrift, 1931, p. 428.)

Haemangiomatosis was present in a flock of Leghorns. Teleangiektasies, haemangiomota and haemangiosarcomata were found in liver, lungs, heart and skin. In-breeding was probably the cause.

Two cases of Adeno-carcinom in fowls. Diva slutschaja Adeno-carcinomi kuritz. Utschemie sapiski Kasan. Vet. Instit. Tome 38, p. 304. (Ref. Tierärztliche Wochenschrift, 1931, p. 427.)

In the first case there was a serious disease of the intestine and the mesenterium. The intestine was covered with grey coloured protrusions varying in size from a pin-head to a pea. The thin intestine was most severely attacked. In the second case it was the mesenterium which suffered most. The protrusions were as large as hazelnuts. The oviduct was swollen and covered with protrusions. Microscopic examination showed carcinom cells. The tumors originated in the intestinal glands.

Angio-myxosarcome in a Capon. R. G. Alvarez. Revista de Higiene y Sanidad Pecuarias, T. 20, no. 6.

In a capon, which had shown no suspicious symptoms during life, a fairly large tumor was found, intra-abdominal, on the place where the testicles should be. This was oval shaped, of firm consistency, while on the cutting surface more or less hard fibrous zones were interchanged with soft zones of a dark colour which reminded one more of degenerative and haemorrhagic processes. The following could be histiologically distinguished:

1. A zone with a more net-like appearance, formed by a network of fibres among which were many cell centres. 2. A zone in which numerous cells were to be seen, sometimes much widened. 3. A zone which was more sarcomatous and where the new elements were formed. This zone was rich in polimorf cells with clear centres and vacuoles in the cell-plasma: sometimes multiple giant-cells with one large vacuole, in which were sometimes one or two red blood-vessels, which made one think of a capillar vessel. Although mitoses seldom occurred there were plenty of pinched centres to be seen. The occurrence of this tumor in a castrated cock leads the writer to ask the question „Can castration influence the development of these new formations?"

GENERAL

Report issued by the Poultry Pathological Research Laboratory, Goring, Reading. June 1st, 1930 to May 31st, 1931. H. P. Hamilton, B. V. Sc. Toronto.

During the period covered by this report 1951 breeders have sent into this laboratory alone 763.619 samples of blood. The official organ of the Surrey County Poultry Society, called „Chanticleer" does not accept advertisements from breeders whose flocks have not been tested to their satisfactions. Number of chicks examined 5684, adults examined 722.

By various improvements Dr. Hamilton has now grown to the occupation of over 3600 square feet of laboratorium and offices, devoted solely to the work of combating poultry-diseases. By means of a day and a night staff the laboratory was able to cope with 15.000 samples in 24 hours.

The reports contents are further: Testing Birds of Export, Hospital, Liaison, Lectures, Special Service Scheme, Free Flocks, Recommendations, chemical Analysis, Short courses in Poultry Science, Visitors. **Factors concerned with Testing for B. W. O., Some Observations on Variations in the Agglutination Test for Salmonella Pullorum adult carriers.** (Conclusion: a „negative phase" may occur in the antibody formation against S. pullorum infection in the blood of an adult fowl. Where faint reactions are noted a stronger reaction will usually be found in another 24 hours). **A possible source of Pullorum Infection** (by the feeding of raw infertile eggs to adult stock). **Breeders' Criticisms. A summary of Results on a Farm heavily infected with Pullorum Disease.** The taking of **Blood Samples. Poultry in Orkney. Post-Mortem Examination Section. Statistics.**

Station for the Study of the Pathology of Poultry at the School at Alfort. Station d'Etudes sur la Pathologie des animaux de Basse-Cour à l'Ecole d'Alfort. La Revue Avicole, 1931, p. 237.

The President of the French Poultry Association announced that the members of the bureau had been invited to the opening of the premises, recently built at the Veterinary School at Alfort, for the Station for the Study of the Pathology of Poultry. Messrs. Voitellier, Fouquet and Montero accepted this invitation.

The station is very well equipped and capable of rendering great service to aviculture.

Poultry Laboratory at Petaluma Ready. Poultry Craftsman and Breeder, March, 1931.

The department's remodeled poultry pathological laboratory at Petaluma was formally opened December 22, when work of the new Tri-county Poultry Sanitary District was inaugurated. The laboratory was taken over by the department with the approval of the University of California and at the request of the poultry industry. The laboratory has been entirely remodeled and equipped and a new poultry hospital has been built as an addition to the main building.

The laboratory is now an entirely modern institution for the diagnosis of poultry diseases and should serve as a valuable addition to the poultry diagnostic laboratory in Los Angeles and the Department's main pathological laboratory at Sacramento. Offices of the tri-county district, which is composed of Sonoma, Marin and Napa Counties, are located in the laboratory building. The department is administering trust funds provided by the district for control of diseases which have proven of serious economic concern to the poultry industry.

Post-Mortem Examination of Hens which have died as the result of Disturbance of the Laying Functions. Sektionsbefunde bei Legehennen, die an den Folgen gestörter Legetätigkeit gestorben sind. Prof. Dr. A. Eber. Tierseucheninstitut der Universität Leipzig. Deutsche Tierärztliche Wochenschrift, 1931, p. 129, 150.

From the post-mortem reports on 1103 hens which had died as a result of disturbance of the laying functions it appeared that the formation of thin-shelled eggs mostly leads to fatal diseases of the laying apparatus.

The following are quoted as causes of thin-shelled eggs:—

1. Shortage of calcium.
2. Infection with flukes (Prosthogonimus).
3. Inflammation of the intestines.
4. Improper treatment of the hens.
5. Exhausion of the laying apparatus.

An infectious inflammation of the oviduct, as described by Maas and Aries, was not observed.

A Peculiar Disease in Fowls. Una curiosa enzoozia dei polli. G. Bernstein, La clinica veterinaria, 1930, p. 683.

Remarkable redness of the eyes and afterwards of the whole head, the comb and wattles, appeared suddenly among some of the hens at a poultry farm.

Within an hour difuse cyanosis of the head accompanied by falling and powerlessness of the hens occurred. The disease can cause death within 10 minutes.

Investigations concerning the cause were negative. Blood-letting was also futile. The placing of a number of leeches on the head helped. In order to obtain quicker success wounds were made in the skin of the head and the leeches were placed in these. When signs of asphyxiation appeared one or two spoonfuls of coffee were administered in order to keep the birds alive until the leeches had done their work.

Saprophytic and Secondary Micro-organisms occuring in the Respiratory Tracts of Domestic Fowls and Chickens in Health and in Disease. Journal of Bacteriology, 1931, p. 97. (Ref. Deutsche Tierärztliche Wochenschrift, 1931, p. 413.)

56 fowls and 14 chickens were examined. 42 had died of infectious Tracheitis, 6 of Pullorum infection, 7 suffered from chronic Laryngitis, 5 had paralysis and 10 were healthy. Micrococs were found in 73,81 % of the fowls with Tracheitis, 57,14 % in fowls with Laryngitis and 40 % of the healthy fowls.

Spirochetes were found in 50 % of the hens which died of Tracheitis, in 100 % of those which died of Laryngitis, in 40 % of the hens suffering from paralysis and in 50 % of the healthy fowls and chickens. Bact. coli, Streptococci and Pseudomonas aeroginosa were also found.

The Effect of Various Poisons on Fowls. Ueber die Wirkung verschiedener Gifte auf Vögel. Dr. L. Forchheimer. Würzburg. Tierärztliche Rundschau, 1931, p. 423, 459, 477, 569.

The susceptibility of birds to poisons is different to that of mammals. The following were examined: Urethan, aethylalcohol, carbon-oxide,

carbon-dioxide, sulphur-hydrogen, ureum, cyanic-compositions, coffein, curare, strychnin, morphin, cocain, papaverin, atropin, nikotin, lobelin, akonitin.

Gout and Eosinophilia. Tyakköszoény és Eosinophilia. C. F. Laszlo. Allatorvosi Lapok, Tome 53, p. 238. (Ref. Berliner Tierärztliche Wochenschrift, 1931, p. 428.)

In a post-mortem examination of a hen gout was found. An histiologic examination proved that in the spleen strong and in the liver weak eosinophily were present.

Misforming of the Wing-feathers in a Goose. Eine eigenartige Miszbildung der Schwungfedern einer Gans. Dr. Fr. Puntigam, Brünn. Wiener Tierärztliche Monatschrift, 1930, p. 364.

Article with photograph. The quil of the feathers of an 18 year old goose showed circle shaped swellings. The feathers of the goose were formerly normal. Probably a sign of old age.

Combatting Diseases in Austria.

The Association for Combatting Diseases, Department Animal Disease Diagnosis at Mödling near Vienna, and the Veterinary Investigation and Information Institute at Lenz a.D., Schlachthof, undertake free of charge, post-mortem examination of birds which have died a natural death or have been killed.

When birds are sent for examination, information regarding the symptoms of the disease and the feeding system should, if possible, be stated. The result of the examination will be sent to the owner free of charge.

Both institutions carry out examinations of blood samples for Bact. Pullorum gratis. The blood samples should be sent in by veterinary surgeons.

Cannibalism in Fowls. Ueber Kannibalismus bei Hühnern. Dr. H. Krause. Bacteriologisches Station des Veterinärwesens Hamburg. Deutsche Tierärztliche Wochenschrift, 1931, p. 166.

Description of a case at a laying-test where the hens were excellently fed. The hen concerned regularly laid big eggs and on the occasion of prolapsis of the cloaca she was attacked by the other hens and the intestines were pulled out. Foulty feeding could not have been the cause.

Cannibalism in Fowls. Ueber Kannibalismus bei Hühnern. Prof. Dr. R. Reinhardt, Leipzig. Deutsche Tierärztliche Wochenschrift, 1931, p. 370.

Cannibalism among fowls happens frequently. It is caused by the natural desire of the birds for blood and fresh meat. It is aroused by the sight of bleeding wounds, prolapsis of the cloaca etc. Faulty feeding is also a cause (lack of proteins, minerals or vitamins) and the crowding of many birds in a small space. Feather-eating, toe-picking and egg-eating are sickly deviations which, in so far as their causes are concerned, belong to one group.

Gout. Craig. The Veterinary Record, 21 March, 1931.

This disease is especially prevalent among hens and turkeys. Special symptoms are the increase of the content of uric acid in the blood and the ejection of uric acid salts on various parts of the body.

Various causes of gout are described as well as the symptoms of the disease and post-mortem changes.

NUTRITION

Harmful Action of Fatty Fishmeal. Deutsche Landwirtschaftliche Geflügelzeitung, April, 1931.

Five groups of chickens were fed for a period of 8 weeks with the same basal ration and fishmeal of varying fat content. The chickens fed with fishmeal of 1,5 % fat were the heaviest at the end of the test period and per pound body weight had consumed the least food. Among the birds fed with fishmeal of 18 % fat content there was a death rate of 23 %. A high percentage of fat also left much to be desired in connection with the colour of the plumage, the development of the body and the formation of yellow pigment in the legs.

The chickens fed with fishmeal of a low fat content were quicker on the lay. A high fat content decreased the laying capacity which could even have influenced the following generation.

Iodine in Fishmeal. Der Jodgehalt unserer Nutzfische. Zeitschrift für Fleisch- und Milchhygiene, 1931, p. 246.

Haddock contains 6,23 m.gr. iodine to 1 K.G. of fish and 29,54 in 1 K.G. fishmeal. Cod 5,17 m.gr. and 24,55, herring 0.17 and 0,52, salmon 0,26 and 0,50, mackerel 0,45 and 1,75.

The fatty parts of fish contain more iodine than the lean parts. In comparison with the fatty kinds of fish the lean species are very rich in iodine. The iodine content is dependent on the food and varies accordingly. It is greater in the intestinal canal than in the muscles. Two thirds of the iodine is lost by drying. There is not much iodine in cod liver oil. There is more iodine in fresh than in conserved fish. Fatty herring-meal contained more iodine than lean fishmeal.

Examination of Fishmeal. Ueber ein Untersuchungsverfahren zur Unterscheidung zwischen zufälliger Verunreinigung und absichtlicher Verfälschung von Fishmehlen mit Knochenmehl. Dr. Clauszen. Pathologisch-anatomisches Laboratorium des Veterinärwesens in Hamburg. Zeitschrift für Fleisch- und Milchhygiene, 1931, p. 137, 344.

The bone-lacunes make it easy to distinguish mammal bonemeal from fish bonemeal.

It can sometimes happen however that mammal bones appear in fish bonemeal e.g. from seals, bones left over from the meals of the fishermen, rat bones etc. As the difference in price between bonemeal from British India and fishmeal is about 6—10 R.M. per 50 Kgs. mixing would only be profitable if more than 5 to 10 % were added.

As the result of numerous examinations the writer states that in 0,01

gram fishmeal no more than 100 pieces of mammal bonemeal may be present.

Accidental Adulteration of Fishmeal with Mammal Bones.

In connection with the adulteration the writer has examined various kinds of fishmeal and gives a review of the results and methods of examination.

The various kinds of fishmeal were divided into two groups. One group consisted of the pure cod-meals with a bone content of 40 % and more and the other group consists of all the other kinds.

The Distinguishing of Bone Pieces of Land Mammals, especially of cattle and of those of whales.

Differences are also to be seen between bonemeal from British India and whale bonemeal.

The differences are described in detail.

Fisheries By-Products. Agricultural and Industrial Progress in Canada. Can. Pac. Railway, Montreal, March '31.

Canada is building up a considerable industry in the by-products of the fisheries. The main industry of the Dominion itself ranks among the leading fishing industries of the world, and in exports Canada ranks among the first three. The by-products industry is of comparatively recent development, but much progress has been made in the last few years, and further expansion is expected by those in close touch with the industry generally.

The fisheries by-products industry puts three chief commodities on the market. These are medicinal cod liver oil, other fish oil and fish meal. Medicinal cod liver oil has the smallest production from the point of view of quantity, but is, on the other hand, the most valuable. During the year 1929 the output of medicinal cod liver oil was 91,022 gallons, while the fish oil output as a whole totalled 4,506,316 gallons. The marketed value of fish oil as a whole, according to figures issued by the Dominion Department of Fisheries, was $1,845.000 during the year. Fish meal production is estimated by the same authority at 22,700 tons with a marketed value of $1,013,000.

The larger part of the annual production of fish meal, a commodity which is of exceptional value as a food for poultry and live stock, is exported to the United States, Germany, Japan, and the Netherlands. Much of the fish oil, which is used in paint manufacture and for a variety of other commercial purposes, is also exported, going to the United Kingdom, the United States and the Netherlands.

Pilchards.

Pilchards are the largest source of supply for raw material for use in the production of fish oil and meal. These fish are taken in British Columbia waters only, so far as Canada is concerned, and their use for by-product purposes has rapidly reached large-scale proportions in the few years since their use in this way was first permitted. In 1929 the output of pilchard oil was over 2,856.000 gallons, with a market value of more than $1,128,000. Pilchard meal production amounted to 15,826 tons, with a marketed value of nearly $657,000. Whale oil production in the province in 1929 totalled approximately 713,000 gallons, and there was also some use of herring, greyfish, etc., in manufacturing oil and meal in British Columbia. On the Atlantic coast the herring and cod fisheries are the principal sources of supply for material used in reduction plants. Medicinal cod liver oil is produced on the Atlantic coast only and is of a quality which makes it in ready demand.

The value of the production of the main fisheries industry of Canada has increased by more than one-half in the last eight years. During the war high prices took the value of Canadian fisheries up to a figure which has not subsequently been reached. The year 1929 saw a small decline from the year before but a substantial increase over 1927. The decline was due to the falling-off

of the salmon fishery in British Columbia, but during 1930 this fishery has achieved a new record. The record of war production was reached at $60,259,000 in 1918, and from this point there was a decline to $34,931,000 in 1921. Since the war the record production was $56,360,000 attained in 1926. Production in 1929 was $ 53,518,000. Last year the catch of fisheries generally showed a decline, but the record of salmon, which was the lowering influence in the 1929 returns, is estimated for 1930 at 2,175,000 cases. This is an increase of over 800,000 cases from the 1929 figures.

Effect of Cod Liver Oil on Calcium Metabolisme of Young Chicks. A. D. Holmes and M. G. Pigott. Research Laboratory, The E. L. Patch Cy. Boston, Mass. Industrial and Engineering Chemistry, 1931, p. 190.

Summary:

The investigation discussed above was undertaken to determine the influence of cod liver oil on calcium metabolism in young chicks when supplementary calcium was obtained from different sources, fed at different levels and was available in different ratios to phosphorus. Four hundred and thirty vigorous, day old Rhode Island Red chicks were divided into twelve comparable pens and fed a typical all mash poultry ration which had been prepared under commercial conditions. Data were collected concerning rate of growth and bone development as indicated by length, diameter, weight, ash, calcium and phosphorus content of tibiae removed from typical birds when 3, 6 and 9 weeks old.

The best growth 2 ponds at 9 weeks was obtained in pens receiving cod liver oil as a supplement to rations containing from 1 to 4 percent calcium and having a maximum calcium to phosphorus ratio of 2.0 to 1.0. Other rations containing 4 per cent of calcium, but having a calcium to phosporus ratio of 5.0 to 1.0 produced poor growth and unsatisfactory feathering and physical appearance regardless of whether or not cod liver oil was added to the ration.

Judged by chemical and histological examination of tibiae of test chicks killed at various stages of the experimental period, the best calcium utilization occurred in those pens receiving cod liver oil as a supplement to rations in which the ratio of calcium to phosphorus was relatively low, where the ratio of calcium to phosphorus was 5.0 to 1.0 calcium utilization was decidedly unsatisfactory.

Even when there was little difference in the growth of experimental birds and corresponding controls, chemical and histological examination of the tibiae showed that with a calcium to phosphorus ratio of 5.0 to 1.0 calcium was better utilized by birds receiving cod liver oil than by corresponding control birds. On the basis of the data obtained in this investigation, it is apparent that cod liver oil is very effective in promoting calcium utilization when calcium comprises 1 to 4 percent of a typical all mash poultry ration and when the ratio of calcium to phosphorus in the ration is low. It was found to be less effective in promoting calcium metabolism when the ratio of calcium to phosphorus was 5.0 to 1.0 even though the calcium content of the ration did not exceed 4 per cent and the calcium was obtained from a variety of sources.

Antirachitic Properties of Shrimp-oil. Brooks, Abernethy and Vilbrandt. Journal American chem. Society, 1930, p. 4940.

The fat extracted by means of aether from the waste of the shrimp industry contains 19 % cholesterine. This fat proved to have an antirachic action but it was weaker than that of cod liver oil.

Vitamins in Whale-Liver-Oil. Signe and Sigval Schmidt-Nielsen. Det Kongelige Norske Videnskabers Selskabs Forhandlinger. Trondjem, 1930, No. 5.

From the liver of the whale Balaenoptera borealis a thick oil was extracted by means of aether which was rich in vitamin A. (1000 American A. units). This oil was very poor in Vitamin D. (less than 20 American D. units).

Adulteration of Cod Liver Oil. Verfälschung von Tranen. M. Auerbach. Allgemeine Öl und Fett-Zeitung, 1928, p. 127. (Ref. Die Fischwirtschaft, May, 1931.)

Two samples of Norwegian cod liver oil were examined. They remained cloudy even when warmed. When shaken with water and phenolphthaleine the water was coloured a deep red. It was proved that the manufacturer had treated the oil with alcalines in order to decrease the content of fatty acids. When liver oil is tested therefore alcalic reactiony matters should be looked for.

Fishmeal and Liver-oil from Madagascar Sharks. E. Jaquin, La Pêche Maritime, 14, p. 349. (Ref. Die Fischwirtschaft, May, 1931.)

A description of the sharks near Madagascar. Five products are prepared from these sharks, which are further described, viz. (1) the fins, (2) the skin, (3) Liver Oil, (4) the edible flesh, (5) the fishmeal.

The intestines are also prepared in another way viz. stomach and intestines to a kind of hide; bones and skin waste to glue; the bile us used as a stain and insuline (which is a good cure for diabetes) is made from the pancreas gland.

Antirachitic Potency in Relation to Volume of Oil in the Liver of the Cod. A. F. Hess, New York. Ch. E. Bills and E. M. Honeywell, Evansville, Indiana. Journal American Medical Association, 1929, p. 226.

In Scotland during the summer the liver has been found to be approximately 1/36th the weight of the fish and to contain about 48 % of fat, whereas in the autumn the liver was only 1/55th the weight of the fish and had a fat content of but 32 %, 50 % less than a few months previously. In New Foundland at the height of the fishing season the liver weighs about 1/14 as much as the entire fish and contains about 50 % of oil.

Authors have been carrying out a study of the relation of the antirachitic factor to reproduction in fish and in birds.

For a fish of given size, antirachitic potency varies inversely with the amount of fat or oil in the liver. The liver-oil ratio was but 5 in the instance in which the potency was only 150 but when the potency reached the highest peak of 20.000, the liver-oil ratio was 107.

A tabel gives a summary of relation of antirachitic potency to amount of oil in liver and weight of liver in the cod.

Also with the livers of haddock and of pollock similar inverse ratio exists between the antirachitic potency of liver oil and the size of livers and the amount of oil that can be extracted from them.

Authors believe that this phenomen results from an oxydation of the liver fat, which comes about in the course of starvation. The antirachitic factor resists oxydation, remains behind and becomes concentrated in a liver that is shrunken and greatly impoverished.

Authors conclude that the oil from certain codlivers is fully 1000 times as potent as that from other of the same species.

Vitamins A and D in Fish Oils. E. M. Nelson and John Ruel Manning. Protein and Nutrition Division, Bureau of Chemistry and Soils, and Division of Fishery Industries, Bureau of Fisheries, Washington, D. C. Industrial and Engineering Chemistry, Published by the American Chemical Society, 1930, p. 1361.

The total production of fish oils other than fish liver oils in this country during 1929 was more than 12,000,000 gallons. The six most important oils are sardine, menhaden, Alaska herring, salmon, Maine herring, and tuna, and the annual production of these oils ranges from approximately 6,500,000 gallons for sardine to 60,000 gallons for tuna. At present these oils are used principally in the soap industry and as drying oils in the paint industry, and also to some extent for leather sizing and tempering steel.

Studies on some of these oils that have been made within the last six years show that they contain varying amounts of vitamins A and D. In view of the importance of these vitamins in the feeding of farm animals, poultry particularly, and the fact that the quantity of fish body oils produced can be greatly increased and the quality improved, a more thorough study of these oils seemed desirable. The Bureau of Chemistry and Soils of the United States Department of Agriculture and the Bureau of Fisheries of the United States Department of Commerce coöperated in these investigations.

Rather than make the preliminary tests on carefully prepared oils that would show the maximum vitamin potency for each of the species, it was decided to use commercial grades of oil which would be considered typical of the material now available on the market so that the results would be capable of immediate application. The oils were obtained from concerns engaged in fish-oil production, and the origin and method of manufacture of each were known. The method of obtaining oil from fish or fish offal is much the same, irrespective of the kind of fish used. The material is subjected to cooking, with or without steam pressure, after which the oil is expressed, usually by the so-called continuous screw press. The oil is separated from water in settling tanks, and in some cases stearin is afterward removed by chilling.

Tuna and sardine oils were found to be as good as, or better than, cod-liver oil in vitamin D potency. Menhaden and salmon oils are also important potential sources of this vitamin. Salmon oil proved to be as potent in vitamin A as the poorer grades of cod-liver oil used for medicinal purposes. These results are important commercially because they point the way towards a potential domestic source of vitamin-bearing fish oils, whereas at present the United States is forced to import about 90 per cent of the cod liver oil used in animal feeding.

Protein Concentrates. F. E. Mussehl, University of Nebraska. The United States Egg and Poultry Magazine, January, 1931.

At last thirteen products are entitled to consideration as important protein concentrates. These differ greatly in the relative costs per unit of protein, in palatability and in their ash, mineral and vitamin content.

Description of experiments at the Nebraska station on protein utilization. All rations were adjusted to exactly the same protein level.

These experiments do indicate that the biological value of milk proteins is as high as are those of fish meal and meat scrape. The relatively high cost of milk products makes their choice as the chief source of supplemental protein

impractical unless skim milk is available right on the farm. Milk products should be combined with other concentrates like fish meal, meat and soybean meal. Of the plant proteins soybean meal was best utilized though it may be observed that none of the plant proteins were quite as well utilized as the better types of animal proteins. The result with blood meal, a strictly animal product, shows definitely that animal products vary greatly in their biological value.

These experiments do not answer all of the many questions on protein utilization. The represent only a very elemental start on what is accepted to be one of our greatest nutritional problems.

The Value of Various Proteins. Dr. Bruno Leschke. Zentralblatt für Kleintierzucht, 1931, p. 26.

The writer made experiments with various kinds of protein: meatscraps, fishmeal, dried buttermilk, dried yeast, skimmed milk.

The laying capacity was best with skimmed milk, hatching ability best with dried yeast, dried buttermilk and meat scraps are equal value and somewhat better than fishmeal.

The best results were obtained in a control-pen where all five kinds of protein-sources were fed as a mixture.

Differences in the Need of Vitamins in the male and Female. Vitaminreserve des männlichen und des weiblichen Geschlechts. Prof. E. Poulsson, Statens Vitamininstitut in Oslo. Deutsche Medizinische Wochenschrift, 1930, No. 40.

(As rats have lately been used for purposes of vitamin experiments I think it desirable that the following remarks should be brought to the notice of our readers, especially as the rat, as a light avoiding, burrowing mammal, appears to me to be a totally unsuitable object for the purposes of judging feeding questions concerning egg-laying animals which live in the daylight. te H.)

From the investigations made by Birnbacker in connection with 330 cases of Xerophthalmy caused in people in Vienna by lack of vitamin A., it appeared that only 38 cases or 11,5 % referred to women.

Up to the age of 5 years both sexes were about equal as regards susceptibility, but after the fifth year, when the sexual differences became more pronounced, great differences appeared. Of 107 cases in adults only two concerned women. In pregnant women, however, susceptibility was very great and these are not included in the above cases.

The female body has thus a reservoir of vitamin A which is used during pregnancy. This is probably also the case with vitamin D. In 75000 cases of rachitis the number of boys was twice as large as that of girls. The vitamin reservoir is probably in the fat under the skin. The fat of bulls and cows also varied in this respect.

Vitamine Content of various kinds of Grain. Praktische Erfahrungen über den Einfluß der Nahrung bei experimenteller Erforschung des Vitamingehaltes verschiedener Stoffe. Cyrill Kucêra. Z. Tierzüchtg. T. 13, p. 391. 1929. (Ref. Züchtungskunde, 1929, p. 262.)

The writer points out that in all the kinds of grain which have been examined (Rye, Wheat, Oats, Barley, Maize, Peas, Clover and Beans) large quantities of vitamine B have been found. It was further proved that the vitamine value of the food waste from corn mills has, up to the present, been too much

neglected and it has been ascertained that an ordinary food ration of such waste contains a sufficient quantity of vitamine B for domestic animals. In spite of former research it is stated that a deficiency of vitamine B does not result in a noticeable decrease in weight. It was also proved that it is incorrect to assume that wheat is a better source of vitamine B than other kinds of grain.

Further Research in connection with the Decrease of the Vitamine B Content as a result of the germination of Grain. Weitere Versuchsergebnisse über Abnahme des Vitamin-B-Gehaltes beim Keimen der Getreidekörner und Hülsenfrüchte. Cyrill Kucêra. Z. Tierzüchtg. T. 13, p. 387. 1929. (Ref. Züchtungskunde, 1929, p. 263.)

Rye, Barley, Oats, Maize, Peas, Clover and Beans were allowed to germinate for 3, 6, 9, 12, 15 and 18 days and young pigeons were then given as much as they could eat in order that, by controlling the weight, it could be ascertained in how far vitamine B was present. In Rye vitamine B disappears after 6 days germination and in Barley after 15 days. In Oats and Maize it disappears much slower which would prove that slower germination results in a slower disappearance of the vitamines. After an equal period of germination pulse were found to contain a larger quantity of vitamine B than grain. During the germination of wheat vitamine C forms just as well in darkness as in light so that neither sunlight nor chlorophile are necessary for its formation. In the course of six days germination the maximum quantity of vitamine C was formed. It may be assumed that vitamine C is formed in grain during the process of swelling. In the case of pulse and especially beans, it was proved that a quantity of vitamine C is present after they have been swelling for 6 hours, which in a dose of 20 grams is a good preventative against scurvey. After 5—6 days germination the maximum quantity of vitamine C is present both in grain and pulse.

The Digestion of Fat by Hens. Versuche über die Fettverdauung beim Huhn. K. Güntherberg. Tierphysiologisches Institut der Landwirtschaftlichen Hochschule, Berlin. Wissenschaftliches Archiv für Landwirtschaft, 1930, p. 340.

The statements given in literature regarding the digestion of fats vary enormously, between 0 and 100 %. Experiments were carried out on twelve hens.

When food containing no fat was given more fat was ejected than consumed. This ceased after 8 days. From this it must be assumed that when determining the content of fat in the faeces, materials are included which have their origin in the ejection from the intestines or bile.

The experiments prove that hens are able to digest fat. The digestion of the fat takes place in the small intestine. Fat splitting ferments must, therefore, be present there.

Among grain the fat of maize is the most easily digested followed by oats, barley and wheat in respective order. This is consequent on the varying smelting point of the fats in the grain.

The largest digestible quantity was about 4,7 grams per day. If more is fed the digestion decreases. If meat scraps are added to barley the fat in the meat scraps was well digested in small quantities up to 2 grams and the digestion of the fat in the barley also increased. If larger quantities were given the digestion decreased and changed to a depression. The kind of food given plays a great part, as was proved by the experiments with maize and fishmeal.

The Time spent by various Foods in the Bodies of Fowl and Pigeons. Die Durchgangszeiten verschiedener Futtermittel durch den Verdauungskanal bei Hühnern und Tauben. R. Habeck. Tierphysiologisches Institut der Landwirtschaftlichen Hochschule, Berlin. Wissenschaftliche Archiv für Landwirtschaft, 1930, p. 626.

A great number of experiments were carried out on fowl and pigeons in which hard and soft food was used. By means of colouring with Fuchsindiamant it was ascertained how long food remained in the bodies of the test birds.

It appeared that the time was influenced by the kind of food, the quantity, composition and humidity of the food, also by the other food and the drinking-water. Individual differences also played their part.

After a meal of wheat, barley, oats or maize hens began to eject in 2½ to 3½ hours. Oats after 2 hours. The termination of the ejection was quickest after feeding with maize, 50—70 hours: wheat after 102 hours and oats and barley 119½ hours.

It is possible for the food taken last to past that taken earlier and it can also be ejected quicker.

Soft food was ejected quicker, from 1 hour 50 minutes to 3 hours. A decrease in the water ration leads to a delay injection.

The same results were observed in pigeons. A knowledge of this data is of great importance in connection with food experiments.

Metabolism in Birds. Untersuchungen über den Grundumsatz der Vögel. D. Herzog. Tierphysiologisches Institut der Landwirtschaftlichen Hochschule, Berlin. Wissenschaftliches Archiv für Landwirtschaft, 1930, p. 601.

The experiments which up to the present have been described in literature and which show strongly varied results are subjected to a profound criticism and the mistakes made in these experiments are shown.

Experiments were carried out on various kinds of birds: fowl, geese, pigeons and ducks. The respiration apparatus of M. Steuber was used. Of all the birds examined the cock had the highest metabolism figures. In daylight this was on an average 1312 calories per square metre body surface.

There was a clear sexual differene in fowl and geese. In hens the figure was only 881 calories.

In all birds the figures were much lower during the night than during the day. The difference was from 4,6 to 25—28 %. The biggest decrease was in the cock (25—28 %). In night birds (fowls) the figures were higher during the night.

The decrease in the temperature of the surroundings from 22 to 8,5° C. had little influence on hens. The Respiratoric Quotient of hens appeared to be very low as compared with that of mammals. Figures to 0,529 were observed.

The Influence of Ferments in Vegetable Food on the Digestion of Carbo-Hydrates in Animals. Quantitatieve Untersuchungen über die Beteiligung der in der pflanzlichen Nahrung enthaltenen Fermente (Nahrungsmittelenzyme) an der Kohlehydratverdauung im Tierkörper. Prof. Dr. E. Mangold and J. Dubiski. Tierphysiologisches Institut der Landwirtschaftlichen Hochschule, Berlin. Wissenschaftliches Archiv für Landwirtschaft, 1931, p. 507.

Comparative experiments were carried out in connection with the digestion of barley and oats in the gizzard of birds and in thermostates.

In the thermostate there was a greater carbo-hydrate digestion with pH 4,7 than with pH 6,8. Also in finer division of the grain than in coarser division and after 18 hours as against 5 hours.

If the grain had been previously boiled less carbo-hydrates, and especially sugar, were formed. If $^2/_3$ of the grain were boiled and $^1/_3$ given raw then the amylases of this raw grain were sufficient to release just as much carbo-hydrates as when the whole of the grain had been raw. The carbo-hydrates of barley were digested in the gizzard of hens by the action of the diastase present therein while pure fecula was not digested, as no diastase is present in the saliva and gizzard-juice.

Five hours after feeding with barley the gizzard contained 8 % dissolved carbo-hydrates and nearly 5 % sugar. The ferments from the barley, therefore, digest from 5—10 % of the fecula in the body.

An accurate determination was difficult as during the time of the experiment a part of the barley passes the gizzard and because the favourable degree of acidity of pH is only reached after 5 hours.

Digestion of Keratine, especially of Horn substance of Bird Feathers, by Mammals and Birds. Die Verdauung des Keratins, besonders der Hornsubstanz von Vogelfedern, durch Säugetiere und Vögel. Prof. Dr. E. Mangold and J. Dubiski. Tierphysiologisches Institut der Landwirtschaftlichen Hochschule, Berlin. Wissenschaftliches Archiv für Landwirtschaft, 1930, p. 200.

Cats, dogs, rats and an owl were used for experiments in connection with the digestibility of Keratine. The feathers of a white goose were fed as horn substance.

The digestion was microscopically and chemically studied. The digestion of the feathers was mechanically strong but not chemically. Twelve photographs illustrate the detail description of this digestion. The powers of digestion varied in different animals.

The horn substance also remained chemically undigested in cases where there was a lack of cystine and where the growth of the test animals could be made normal by feeding cystine.

Nutrition Experiments with Calcium. Fütterungsversuche mit besonderen Gaben von Kalk. Dr. W. Kupsch, Berlin. Experiment Station of the Deutsche landwirtschaftliche Geflügel-Zeitung. Tierärztliche Rundschau.

Experiments were carried out with chickens which were fed with common calcium salts and oyster shell in conjunction with control chickens fed with a calcium preparation consisting of calcium-chloride, Phosphoric-salt and radiated yeast. The chickens fed with the latter preparation grew noticeably quicker than the control chickens while the young hens also laid better.

Rearing and Feeding of Poultry. Aufzucht und Ernährung der Hühner. Dr. L. Weinmiller. Poultry Experiment Station, Erding, Bavaria. Anleitungen der Deutschen Gesellschaft für Züchtungskunde, 1930, Heft 8.

In this richly illustrated brochure the various methods of rearing chickens and of the manner of feeding during various periods are described in detail.

Poultry Feeding Tests. Experiments at Werribee. W. C. Rugg, Chief Poultry Expert. The Victorian Poultry Journal, March, 1930.

One of the experiments was designed with a view to ascertaining whether by the addition of minerals to the feed the texture of the shells of eggs could be strengthened. There is a growing number of rejections because of the shells as well as because of a deficiency in internal quality, a deficiency due chiefly to enlarged air cells and weak albumen (watery whites). Officers of the Victorian Department of Agriculture have for the past three years been carrying on experiments which it was hoped would lead to a solution of the problems, but so far without success.

Thin shells. The experiment consisted of the addition of a mineral mixture, which contained potassium iodide to the ordinary food. Eggs with shells of less than 0.32 millimetres in thickness were too frail to be handled satisfactorily.

No conclusion could be drawn from the results obtained and it was decided that the test should be continued for an other year.

Other Feeding Experiments.

An experiment was made to test whether a greater number of eggs could be obtained from birds, if in addition to wet mash they were given dry mash as well. Although the birds in the test pen consumed 9 lbs. more wet mash in addition to 10 lbs. dry mash, they lost an average of nearly 13½ ozs. in weight per bird, but laid on an average eleven eggs more per bird.

Another experiment carried out was one to try if satisfactory results could be obtained from feeding lucerne chaff in dry mash. The dry mash pen laid 18 eggs more per bird than the control-pen.

Poultry Experimental Feeding Test, Conducted at Mt. Gravatt, Brisbane. Department of Agriculture and Stock, Brisbane, Queensland. June 1930.

Owing to the rapid development of the Poultry Industry and the resulting increased demand upon the more popular poultry foods a test was commenced on the 1st May, 1929 with the object of making a comparison with wheat and wheat by-products on the one hand and maize and maizemeal on the other; and as barley can be secured at reasonable prices at times, it was considered desirable to utilise this grain in a test also.

The test was made to serve a double purpose in so far as that individual records of production were obtained per bird as well as determining the suitability of various food for egg production. The test commenced with 288 birds belonging to different poultry breeders. Each breeder supplied 24 birds of the same age, breed, and, as far as possible, of the same strain. These birds were divided into groups of eight and placed in a large shed for intensive attention with a similar number of birds of other breeders. By working along these lines it was thought that the average breeding of the birds in each pen would be uniform, and in order that the breeders who supplied birds would gain some advantage, the birds were all trap-nested and their owners supplied fortnightly with the progressive results of egg production.

Feeding.

The system of feeding was to place a mixture in the form of dry mash in hoppers. The grain was also fed in hoppers. Under these conditions the birds were at liberty to consume as much as they desired of either mash or grain. In A pen the mash was composed of 37 % of maizemeal, 20 % of bran, 15 %

of lucerne meal, 10 % of pea meal, 10 % of beat meal, 5 % of cotton seed meal, 2 % of bone meal and 1 % of salt, while the grain supplied was whole yellow maize. In Pen B the mash consisted of 52 % pollard, 26 % bran, 12 % lucerne meal, 7 % meat meal, 2 % of bone meal and 1 % of salt, while the grain supplied was wheat. In the other pen neither bran nor pollard was used in compounding the mash, a feature of considerable importance to poultry raisers in Queensland. The mash, in this case, consisted of 52 % of maize meal, 15 % of lucerne meal, 10 % of pea meal, 10 % of meat meal, 10 % of cotton seed meal, 2 % of bone meal and 1 % of salt. With the grain supply another departure from the usual practice was adopted in the feeding of barley. In addition a quantity of lawn clippings was supplied to each pen regularly.

Average food Consumption.

	Pen A.	**Pen B.**	**Pen C.**
	lbs. ozs.	lbs.ozs.	lbs.ozs.
Grain per bird . . .	38.1	57.4	43.6
Mash ,, ,, . . .	31.3	18.5	27.5
Total . . .	69.4	75.9	70.11
Food consumed	ozs.	ozs.	ozs.
daily per bird . . .	3.4	3.7	3.4

Laying. From 1.5.29 to 30.3.30.

Pen A, 11750 eggs. Pen B, 12229 eggs. Penn C, 11380 eggs.

Two features brought out in this test were:

1. The wheat ration gave better production.
2. In both cases where maize was extensively used the proportion of the 1ste grade eggs was greater than that from the wheat ration. There were also considerably fewer undersized eggs produced.

Values. The table showing the quantity of food consumed for each dozen eggs and the profit over cost does not indicate any very marked advantage in the feeding of maize.

Effect on Bodily Weight. Extensive maize feeding is credited with causing the birds to become unduly fat. There is absolutely no evidence of that being the case in this test.

EGGS, TABLE POULTRY

The pH of the white as an important factor influencing the keeping quality of hen eggs. P. F. Sharp. Science N. S. 69, 1939. (Ref. Züchtungskunde, April 1931.)

Hen eggs which are difficult to keep are easily infected by micro-organisms although new laid eggs usually appear to be free from germs. The significance of hydrogen as a factor which influences the keeping qualities of eggs has not, as yet, been further investigated. Attention has already been drawn to the changes which eggs undergo during storage owing to the penetration of water from the white into the yolk. It has also been observed that as a result of the decrease of CO_2 the pH concentration of the whites of eggs begins to increase directly after laying. This increase can rise from about 7,6 pH in new laid eggs to 9,7 and the alkali content increases simultaneously about a hundredfold; the yolk of a new laid egg has a pH content of about 6,0 which increases by long storage to about 6,8. The pH increase in the yolk is the result of a loss of CO_2 from the white which gives off carbonic acid into the surrounding air. As it is known that a higher pH content accelerates the decrease of proteins an equal increase for the white of the egg may be assumed. When eggs are stored in ordinary air the pH concentration increases and decomposition is hastened. This is, however, delayed by the supply of CO_2 which results in a re-deposit of alkali. The liquifaction of the white of the egg is also frequently caused by a high pH content. The most favourable conditions for the quality and quantity of the white are an average pH content and a moderate concentration of CO_2. By a comparative moderately strong concentration of carbon dioxide the pH of the white of the egg is so decreased that a distinct clouding takes place. This can be remedied if some of the CO_2 is allowed to escape. The protein is then re-dissolved.

The concentration of CO_2 which is necessary for the maintenance of the pH in the surrounding air corresponds with that in new laid eggs and diminishes with a fall in temperature. About 10—12 % CO_2 is necessary in room temperature to maintain the pH of the whites at 7,6 while about 3 % CO_2 fulfills the same purpose near freezing point. A too small hydrogen concentration together with a lack of CO_2 furthers the bacteria danger in the storage of eggs, but if the eggs are properly treated the resultant loss is insignificant. The regulation of the pH content by a supply of CO_2 is of great practical importance, as by this the going bad of storage eggs can be considerably delayed. The supply of CO_2 to the storage place does not need to be so great that it will make presence there intolerable. Special quantities of carbon dioxide are unnecessary as the supply of CO_2 forms a sett-off for the escaping gas. The cost of renewing the CO_2 once per week for six months for the purpose of maintaining a quantity of 1 % in the air of the storage room, is estimated by the writer at less than 12 pfennigs per thousand eggs. The only method which is considered both cheap and practical is the immersion in oil of the eggs to be stored, directly after laying. Through this, loss of moisture and the escape of CO_2 is considerably decreased. By this method the favourable action of a small pH content is aimed

at but the whites of the eggs become cloudy. If, before the eggs are immersed, a comparative proportion of the CO_2 contained in the eggs after laying could be set free, this clouding would be avoided but the full action of a small pH content could not be maintained. The addition of CO_2 would help. The clouding of the whites of eggs stored in a place rich only in CO_2 air, disappears if there is a depreciation of the CO_2 content.

Increase in the PH of the White and Yolk of Hens eggs. P. F. Sharp and Ch. K. Powell. Cornell University, Ithaca, N. Y. Industrial and Engineering Chemistry, 1931, p. 196.

Conclusions:

1. The pH of the white of untreated eggs rises very rapidly after the eggs are laid, owing to the escape of carbon dioxyde. The pH increases more rapidly the higher the temperature.
2. After long periods of storage, particularly at the higher temperatures, the pH of the white begins to decrease.
3. The pH of the yolk increases much more slowly than does the pH of the white.
4. The pH of the yolk and white were found to change very little on dilution.
5. Attention was called to the desirability of the study of the control of the pH of the white during the first few days of incubation.

Determining the Freshness of Eggs. Versuche zur Frischebestimmung von Hühnereiern. G. Gaggermeier. Archiv für Geflügelkunde, 1930, p. 469.

In fresh eggs the pH content rises rapidly in the first days to its highest figure and then remains there.

Eggs, the white of which with phenolphthaline as indicator have no higher figure than 9,2 % present, can in general not be looked upon as being older than three days.

The colorimetric pH stipulation is not suitable for practical examination but it can be used in certain cases together with the candling of the eggs.

Iodine in Eggs for Visitors to Watering-Places. Jodeier für die Kurgäste. Deutsche Landwirtschaftliche Geflügelzeitung, 1931, p. 829.

During recent years more and more has been heard regarding the special action attributed to iodine-eggs. In regard to this the point of view is taken that for curative purposes it is better to give foods than medicines. Iodine-eggs offer the patient an easy and tasty way of taking iodine. On these grounds a doctor in Reichenhall prescribes iodine eggs for his patients in special cases. A poultry farm in the neighbourhood specializes in the production of such eggs. The local association of doctors controls the iodine content. It is possible that other curatives might be administered through the medium of the egg.

Marking of Eggs. Marquage des Oeufs. La Revue Avicole. June, 1931.

After discussion the following proposal, presented by M. Blanchard, were adopted:

1. La Société Centrale d'Aviculture de France,
   Considering that competition in all branches of agricultural produce (eggs,

fruit and vegetables), both on the international and the home market, is due for a great part to the fact that the competitors of French producers have organized themselves with the object of offering only guaranteed products to the purchases:

Considering the delivery of the goods must be in accordance with the offer is one of these guarantees, Propose, that the Minister of Agriculture should adopt with as little delay as possible, the proposal against fraud by the Comité National Permanent de l'Exportation des Fruits et Primeurs taken by the Ligue Nationale de Lutte against the enemies of cultures.

2. La Société Centrale d'Aviculture de France,

Considering that the production of eggs is of great economic, importance to our country;

Considering that foreign competition is making itself felt more and more not only on foreign markets but also on the French market and that as a result of the guarantees which the marking of eggs and the institution of marks offer to the consumers; Propose, That parliament should, with as little delay as possible, introduce a bill for the marking of eggs, institute a national mark for eggs, and in general for poultry products.

Loss from Fertile Eggs. L. L. Lasher. N. Y. State College of Agriculture. U. S. Egg and Poultry Magazine, May 1931.

Formerly there were three serious losses in the marketing of eggs. namely, the loss from breakage in transit, from the handling of many inedible eggs in commerce, and from the general inferior quality at certain seasons resulting from partial incubation of fertile eggs.

Losses from the first two causes have been overcome to quite a large extent, but there are still tremendous losses from fertile eggs amounting to 30-40 million dollars per year. The eggs are not only a loss in themselves, but they greatly reduce the consumption of good eggs. There is nothing that will lessen one's desire for eggs more than to get hold of some poor eggs.

Every effort should be made to reduce these to a minimum. There has been several ways suggested by various colleges. The University of Missouri suggested paying a premium for infertile eggs. There are some difficulties with this, however. The average farm conditions make it rather hard to produce infertile eggs. The roosters are rather valuable as breeders and the producers hate to part with them. The young cockerels are continually coming on and would be just as destructive as the older birds.

Purdue University thinks that it will have to come about by selling eggs on a graded basis. They have tried having the farmer get rid of the old roosters, but there are so many of them that have small flocks and feel that it is not going to pay them to go to all of the trouble to produce infertile eggs. If eggs were sold on a graded basis, then it would be easy to see where it pays to produce infertile eggs.

No matter how it is done, every one should strive to produce infertile eggs. If one expects egg consumption to keep up, one has got to make the conditions favorable to encourage the consumer to eat eggs. When fertile eggs are placed before the consumer, that is the best way there is to discourage the use of eggs.

It may be a little expensive, but the University of Wisconsin suggests that all male birds be eliminted from the flock, or kept by themselves except at breeding time. Something of this kind must be done to raise the quality of the eggs and eventually raise the price.

The University of Illinois has a rather clever idea. They also advocate getting rid of the roosters. They have posters showing both a good egg and a bad one. They bring out clearly how unpleasing to the eye the latter is. Then they end up by saying:

Save the Roosters and Spoil Your Eggs,
Spoil the Eggs and you'll spoil your customers,
Spoil the customers and you'll spoil your profits;
Your egg buyer is your customer.
Sell all poor roosters and confine the good ones now.

Investigations about the Cuticula of the Egg. Über die Kutikula des Vogeleies und einen Nachweis ihres Bildungsortes. E. Furrey, Biologische Zeitung, 1931, p. 162. (Ref. Deutsche Tierärztliche Wochenschrift, 1931, p. 443.)

That the shell of an egg is covered with a membrane was discovered by Baudimont and Martin Saint-Ange in 1847. Wittich (1851) discovered that this membrane had pores. There was no unity of opinion with regard to the place where this membrane was formed. In the shells of Gastropodes-eggs Furrey discovered fluorescences when the eggs were treated with ultra-violet rays. If the eggs remain long in the light the red colour disappears. The ovary and oviduct of a young hen which had not yet laid was radiated. There was no fluorescence in the ovary and albumen parts of the oviduct but the uterus showed a red fluorescence which was of a brownish-red in the underneath part near the lime-glands. The cuticula is therefore formed in the same place as chalk-shell. If light is excluded the fluorescent quality remains present for years. The cuticula is the result of porphyrine ejection (Derrien and Tunhini), this is also the cause of the fluorescence.

The radiation of eggs can therefore be used as a means of ascertaining the freshness.

Inspection of Table Poultry. Nur Lebensmittel Überwachung oder auch Fleischbeschau bei Wild oder Geflügel? F. Güttner. Deutsche Tierärztliche Wochenschrift, 1930, p. 709.

From the standpoint of public health and with a view to preventing disease veterinary control of game and poultry is necessary. Various parliamentary bills are being discussed in connection with this. Meat cool-houses in Berlin are under veterinary control.

Import of Hens and other Poultry in the Union of South Africa. Bulletin international des Epizooties.

A decree issued by the Governor General states that all poultry (hens, turkeys, geese, ducks, guine-fowl, and pigeons) imported into the Union of South Africa must be accompanied by a written statement from the country of origin to the effect that the birds have been subjected to a special examination in connection with tuberculosis, pullorum diseases, and typhoid and have been proved to be free of these diseases.

If unaccompanied by such a written statement they are put in quarantine for an unlimited period.

Birds found to be suffering from disease will be destroyed or returned.

Marketing of Poultry and Poultry Products. C. H. Spanner. Department of Agriculture, Union of South Africa. Bulletin no. 50. Pretoria, 1930.

Foreword.

This bulletin contains the findings of an officer of the Division of

Agricultural Economics and Markets in connection with the all-important question of the marketing system of poultry and poultry-products in the Union. The question is all important not only because of the rapid strides shown by the poultry industry during the last ten or more years, but also because the hen has her place in the economy of every form—however variant that place may be from farm to farm.

Economics, however, it should be remembered, is not an exact science and so allows much scope for difference of opinion. In a report such as this the writer is therefore bound to raise questions on which there may be a great diversity of opinion. Even within the Department differences may be expected in regard to some of the questions discussed and the report therefore does not necessarily interpret the views of the Department. At best it can but reproduce the impressions obtained by an honest investigator of existing conditions and tendencies.

This bulletin therefore is published not as the final word on the subject of which it treats, but in the hope that it may cast new light on some problems affecting the welfare of the poultry farmer and so stimulate thought in regard to those problems. If it should accomplish that, it will have earned sufficient reward.

Contents:

Part I. Introduction. Geographical Distribution of Poultry in the Union. Production. Climate.

Part II. Present Method of Marketing. Producer—Storekeeper. Other Methods of Marketing. (a) Producer—Consumer. (b) Producer—Retailer. (c) Producer—Commission Agents. (d) Producer—Municipal Market Master. (e) Producer—Huckster. (f) The Wholesaler. Liquid Eggs. Poultry. Feathers.

Part III. Transportation.

Part IV. Cost of Marketing. Eggs. Poultry.

Part. V. Co-operation Marketing. Present Depot System. Co-operation and the Country Storekeeper. Co-operation and the Schools. The Handling of Eggs at the Circles. Methods of Selling. Poultry. Poultry Food.

Part VI. Standardisation. I. Payment by Weight. II. Payment by Grade in the Bigger Centres. III. Grades for Internal Quality. IV. Certification of Premises. V. Standard Boxes. VI. Poultry. VII. Standard Poultry Crates. Method of Inspection. Summary of Advantages of Standardisation. Propaganda.

Part VII. Foreign Trade. South Africa's Export and Imports. Poultry. Prices. The Future of the Poultry Industry in the Union. An Egg a Day Campaign.

Preliminary Report on Economic Factors affecting the Production and Marketing of Poultry Products in Utah. Oct. 1 1928 to Sept. 30, 1929. W. Preston Thomas and Marion Clawson.

Annual Summary of Publications, July 1, 1930 to June 30, 1931. Blanche Condit Pittman. Circular 95, July, 1931, Utah Agricultural Experiment Station, Utah State Agricultural College, Logan, Utah.

This preliminary report on the analysis of the poultry business for 1929 will be followed by other progress reports for 1930 and 1931, after which a Station bulletin will appear giving the results for the 3-year period, 1929-31, inclusive. As indicated by the report, the average per-hen capital invested in 1929 was $3.16. The average per-hen production was 152 eggs, while egg-production cost was 26½ cents per dozen and 21 cents, with and without

labor, respectively. The average cost of rearing pullets, not including labor, was 76 cents as compared to 96 cents including labor. Death loss for all farms averaged 16.5 per cent. The poultry business in Utah in 1929 was profitable, as indicated by profit and returns for labor on a per-hen basis of $1.10, with the better poultry farms averaging $1.73.

Report on the Marketing of Poultry in England and Wales. Ministry of Agriculture and Fisheries, London. Economic Series no. 11, 1927.

Table of Contents: Part I. A preliminary survey. I. Supplies: a. Home Production, b. Imports, c. Note on Consumption. II. Prices: a. Wholesale, b. Retail. III. The Course of the Trade: a. Seasonal Supplies, b. General Trade.

Part II. IV. Conditioning and Fattening: a. Fowls, b. Ducks, c. Geese and Turkeys. V. Processing: Killing, Plucking, Roping, Shaping, Cooling, Drawing and Trussing. VI. Grading: a. General, b. The Practice Abroad, c. Suggestions for Home Produce. VII. Packages and Packing: a. Live Poultry, b. Dressed Poultry. VIII. The Marketing of By-Products, Feathers and Manure. IX. Note on the Trade of Table Pigeons.

Part III. Assembling. X. Collection, XI. The Country Wholesaler, XII. Cooperation of Producers.

Part IV. Transportation. XIII. Carriage by Rail, Road and Post.

Part V. XIV. Importers, Commission Salesmen, Wholesalers and Commission Buyers. XV. Producer—Retailer Marketing. XVI. Retail Distribution. XVII. Direct Marketing. XVIII. Markets: a. Local Markets, b. Central Markets.

Part VI. Conservation. XIX. Cold-Storage and Processing.

Part VII. Conclusion. XX. Education in Marketing. XXI. Concluding Observations.

Dressed Poultry. Grading and Marking. Ministry of Agriculture and Fisheries, London. Marketing Leaflet no. 17, 1930.

Contents:

National Mark Scheme for dressed Poultry.

1. Grading. The statutory grade designations are only applicable to dressed poultry produced in England and Wales.
2. Marking. Only dressed poultry produced in England and Wales may be packed under the National Mark.
3. General Arrangements. a. Authorisation of Packers. b. National Mark Egg and Poultry Trade Committee. c. Inspection Service. d. Authorised Packer's Right of Appeal. e. Procedure and Conditions to be observed by Packers authorised to apply tho National Mark.
4. Conclusion.

Table Poultry Production. Ministry of Agriculture and Fisheries. Bulletin no. 18. London. 1930.

Foreword.

The Report presented herewith should be of much interest to all who are engaged in the production of table poultry.

It may suitably be explained that the National Poultry Institute Scheme came into operation largely as the result of representations to the Ministry by the National Poultry Council, the representative organization of the poultry industry, which was established in 1920.

Our national poultry industry had at that time made rapid strides, and was in a position to derive full benefit from organized education and research in poultry matters.

The original scheme provided for only one centre of research, but careful consideration led to a division of the work among several centres at which research work was already in progress. The different lines of education and research and the centres at which the work is being conducted are as follows:—

1. Higher education and research in poultry husbandry at the National Institute of Poultry Husbandry, Harper Adams Agricultural College, Newport, Salop;
2. Nutrition research at Cambridge University;
3. Research in genetics at Cambridge University;
4. Disease research at the Veterinary Laboratory of the Ministry, New Haw, Weybridge;
5. Practical methods of breeding for egg production at the Cheshire School of Agriculture, Reaseheath; and
6. The production of table poultry at the South-Eastern Agricultural College, Wye, Kent.

The total capital expenditure on all branches of the Scheme was approximately £25,500, one-fourth of this being provided by the poultry industry. The whole cost of maintenance, at present amounting to about £9,000 per annum, is met from public funds. The control of the Scheme is in the hands of the National Poultry Institute Advisory Committee of the Ministry, which appointed Sub-Committees to carry out the experimental work at Reaseheath and Wye.

This Report, prepared by the Southern Sub-Committee, gives an account of the experiments in table poultry production conducted at Wye College, and it is hoped that the data so far collected will be of assistance to all engaged in that branch of the industry. The Ministry desires to place on record its thanks to the Sub-Committee and all concerned for the conduct of the investigation and the preparation of the report.

Contents:

Experiments on Table Poultry Production. Introduction.

Part I. Scheme of Experiments. Lay-out of Plant—Feeding—Rearing—Records—Alteration in Hatching and Rearing Methods. Petits Poussins. „Off the Run" or Grass Chickens. Trough Fed Chickens. Crammed Chickens. Feeding Rations. Notes on the Various Breeds and Crosses. Indian Game (Male X Light Sussex (Female)—Silver Grey Dorking (Male) X Light Sussex (Female)—Light Sussex—White Wyandottes—Rhode Island Reds—White Leghorns. Marketing. Style of Marketing—Size of Birds required—Kind of Bird—When to Market. Disease. Bacillary White Diarrhoea—Coccidiosis. Some Conclusions on the Experiments. Appendices.

Part II. Experiments Commencing in 1928. Feeding. Routine Work. Equipment. Petits Poussins. Chickens „Off the Run". Trough Feeding. Cramming. Appendix.

GENERAL

Scientific Poultry Breeding and Keeping. Handbook for Everybody. Wirtschaftsgeflügelzucht und -haltung. Lehr- und Lernbuch für jedermann. F. Römer, Direktor der staatl. anerk. Lehr- u. Versuchanstalt f. Geflügelzucht, Halle-Cröllwitz, und Landwirtschaftsrat Dr. L. Weinmiller, Vorstand der Kreisflügelzuchtanstalt Erding, unter Mitarbeit von Prof. Ambros, Schönbrunn, Dr. R. Fangauf, Steenbek b. Kiel, Minist.-Rat Dr. J. Gerriets, Berlin, Lehrer C. Herbst, Hannover, Konrektor H. Lentzsch, Halle, Minist.-Rat Dr. W. Niklas, München, Handelslehrer W. Richter, Halle, Dr. W. Scherz, Buchenhof, Direktor Dr. F. Schmidt-Hoensdorf, Halle, v. Treuenfels, Demerow. 2. erweiterte Auflage. Mit 129 Abbild. Preis kart. M. 5.60. Verlag von Eugen Ulmer in Stuttgart, Olgastr. 83.

This book of Römer and Weinmiller occupies a special place among literature dealing with poultry breeding. Leading experts in poultry breeding research have created it, so that it is not surprising that the first edition was sold out within a very short time. The new edition has been valuably supplemented and revised. All kinds of questions which engage the attention of poultry keepers and breeders are fully and clearly treated and reference is made to the most recent data obtained from practical and scientific research. Housing, feeding, utility breeding, profit making, breed questions, hereditariness, organisation are treated in the same thorough manner. From the development of the chicken in the egg to the attractively composed sales advertisement one can find everything that the breeder or keeper of the present day needs.

Contents:

Introduction by Dr. W. Niklas, Ministry of Agriculture, Bavaria. The importance of poultry keeping. State measure for the furtherance of poultry keeping. Anatomy of the hen. Science of judging. Breeds. Hereditariness and breeding-science. Incubation. Rearing. Housing. Nutrition. Diseases. Marketing the production. Management. Duck-keeping. Geese-keeping. Turkeys. Pigeons-Associations. Exhibitions.

The Hen on the Farm. Das Huhn auf dem Bauernhof. Eine Anleitung zur zweckmässigen Haltung und Fütterung der Hühner auf dem Lande. R. Römer, Halle-Cröllwitz. Published by the Prussian Ministery of agriculture. Fritz Pfenningstorff, Berlin, 1931. Preface by Mr. Steiger, Minister of Agriculture.

Contents:

Foreword. Range-Houses. Feeding. Incubation. Rearing. Breeding. Marketing. Diseases. Bookkeeping. Literature.

Profitable Poultry Keeping. Wege zur gewinnbringenden Gestaltung der Hühnerhaltung. P. Römer. Sonderheft des „Archiv für Geflügelkunde", Nr. 10, Jahrgang 1930.

The reports concerning the experiments carried out at Cröllwitz in the years 1926—1930, have been published in the two numbers 9/10 of the „Archiv für Geflügelkunde" (Archive for Poultry Science). After an introduction, in which Römer indicates the meaning of food-accounts in poultry keeping and gives definite figures for the cost of food per hen, follow the results of a number of experiments connected with the problem of lessening the cost of production by making food cheaper. To begin with views were put forwarded regarding profitablesness based on actual results of egg production and egg prices. In connection with this a comparison was made between the price obtained in Cröllwitz and the price paid by companies there and further the figures relating to the fluctuations of egg and foods prices are particularly interesting. After a passage dealing with the cost of production of one day chicks there follows a comparison of the profits in the first, second and third laying years, showing that a poorly financed undertaking, which has rent free ground, work not charged for and not taking into account hens in their third laying year which are sold at slaughter prices, still makes a profit. The question relating to the use of trap-nests on egg-producing concerns is answered by the fact that a higher profit is the result of the use of trap-nests. The fattening of young ducks as a side-line on duck egg farms, which is treated in the following chapter, is also looked upon as profitable, in so far as it is possible to find a market for light breeds of ducks. In the further chapters experiments regarding feeding with Lupine fishmeal with dried buttermilk, with Lactic Acid Powder and Vigantol are described.

Experiments with various kinds of glass which allow the passage of ultra-violet rays proved that none of the glasses had any important influence on the growth of the chickens. Then follows experiences concerning self-building of modern hen houses (with the use of bitumenfelt and „Solomit") as compared with en masse produced, ready for use, buildings. Interesting particulars are contained in the „Observations on Incubation in 1930" written by J. Jaeger, e.g. comparisons between flat and forced-air incubations and comparisons between the hatching results of eggs for 1 year hens older than one year.

Finally there is an extract from the thesis by Dr. A. Albrecht on the influence of various kinds of food, (Proteins in various quantities and of various origin) on hatching, rearing and laying qualities in hens of various ages.

Poultry-Husbandry. Geflügelzucht. R. Römer. Poultry Experiment Station, Halle-Cröllwitz. Jahrbuch für Tierzucht, Tome 22. Editor M. & H. Schaper, Hannover, 1930.

Contents:

Results of the poultry census of the 2nd December. 1. Import and Export in Germany, Profit. 2. Production and laying tests in Germany. 3. Breeding. 4. Ducks. 5. Nutrition. 6. Housing. 7. Incubation. 8. Rearing. 9. Marketing. 10. Diseases. 11. Expositions. 12. Meetings. 13. Instruction. 14. Abroad. 15. Literature.

Little Catechism of Poultry Keeping. Kleiner Katechismus der Hühnerhaltung. Gräf. Ch. v. Dürchheim. 3. vermehrte und verbesserte Auflage, 56 Seiten mit 34 Abbildungen. Preis kart. 0.50 Mk. Verlag Fritz Pfenningstorff, Berlin W 57.

A book, composed in such a manner, quite non-technical, that every farmer can obtain from it a sound knowledge of modern poultry keeping. Everything is described simply, how to build a house cheaply, how costly protein foods can be replaced by cooking blood, bones and meat-scraps, how best to rear chickens, What to do in case of disease etc. A book, therefore, needed by the farmers, and which can not be too strongly recommended in agricultural circles.

Poultry Breeding in Germany. Dobberstein, Berliner Tierärztliche Wochenschrift. 1929, p. 421.

The value of the annual turnover of poultry breeding is Germany for the last nine years amounts to 483 million marks. This is five times as large as the turnover for wine and considerably larger than the turnover for sugar (351 million marks) and that of fresh and salt water fish (95 million marks).

The value of the egg production in Germany is increasing from year to year. In 1927 it represented a value of 485 million marks while the total value of all poultry productions (eggs, meat, down etc.) for the same year was 944 million marks. In spite of this the value of the eggs imported into Germany in that year was 276 million marks.

With a view to influencing the trade balance on this side favourably, the Reichstag decided on the 28-12-28 to request the Government to encourage German poultry breeding and to arrange the egg production in the American way, so that the country would be free from imports.

Before the war Russia paid her foreign debts solely from the proceeds of her egg export. The value of eggs exported from Canada ecxeeds that of grain. In 1924 Denmark exported eggs to the value of 150 million Kronen.

The position of German Poultry Breeding. Die wirtschaftliche Lage der deutschen Geflügelzucht. B. Grzimek. Tierärztliche Rundschau, 1931, p. 369.

Of the expense connected with the production of eggs 75 % is for food. The cost of food per egg amounts to 3,3 pfennigs and the average price of an egg is 9 pf. according to the international trade prices.

As a result of the agricultural policy in Germany the poultry farmer receives the international trade price for an egg but for food he must pay a price which is 150 % above this. The world price for maize and wheat is 12 Mk. per 100 K.G. Russia offers wheat at 5 Mk. per 100 K.G. but the German poultry farmer must pay 29 Mk. for this. As a result of this the cost of production is increased to 7,6 pf. so that there can be no question of profit.

In further discussions the writer proves that poultry farming in Germany is unprofitable not through any fault of the farmer but as a result of recent legislation.

The writer advocates 20 K.G. duty free grain per hen per year and stamping of imported eggs.

Encouraging the Export of Poultry. Erleichterung der Ausfuhr von Rasse geflügel. Rutz. Tierärztliche Rundschau, 1931. p. 370.

In order to make propaganda for German poultry abroad it must be exhibited at shows. The re-import of unsold poultry meets however with many difficulties and steps should be taken to ease these.

It would perhaps help if the birds were to be placed in a separate section when exhibited abroad and to have them controlled by a German veterinary surgeon.

Co-operation between „Club" and „Association" in Germany. Gründung einer Arbeitsgemeinschaft zwischen „Club" und „Bund" in Deutschland. Der Nutzgeflügelfreund, 1931, No. 11.

The „Club Deutscher Geflügelzüchter" (German Utility Poultry Breeders Club), and the „Association of German Poultry Breeders" have united in forming a „Reichsinteressenvertretung der Geflügel wirtschaft" (R.I.G.) (Representative State Interest in Poultry Science). The object is the advancement of German Poultry Breeding. Need creates knowledge. Perhaps we in Austria will learn something. In spite of publicity and in spite of the noticeably favourable signs of recent times, poultry breeding is not what it might be and if we consider carefully we shall see that we are in some part to blame. People are always asking us what advantages an association offers. Are there people unaware of the advantages gained from associations by whole classes of people? Only he is heard who has the power of a mass behind him.

Domestic Water-Fowls. Ducks and Geese. All manners of breeding, Breeds, Feeding, Diseases, preparation of Conserves. Palmipèdes domestiques: Canards et Oies. — Leur élevage familial, fermier et industriel. Races, élevage, alimentation, maladies, préparation des conserves. W. Chenevard. 1931. 1 vol, in-16 de 180 pages avec 35 figures. Prix: 7 fr. Librairie J.-B. Baillière et Fils, 19, rue Hautefeuille, Paris, VIe.

The breeding of ducks, disdained by some, has become more and more extensive during recent years. This is due to two qualities which are well demonstrated these days. As a source of food, the duck is one of the most easily assimilated birds we have, and its superiority is just well established even over that of the pig. It accepts food disdained by other poultry. As a profitable investment, by the production of eggs, certain modern breeds are quite equal to our best laying hens.

While the oldest breeds still continue to inhabit the ponds and marshes and the fancy breeds decorate the ornamental lakes in parks, the improved breeds have been specialized in three directions:

1. For their flesh, in view of the rapid production of ducklings for roasting.
2. For their laying qualities, by the creation of foundations for developing their laying aptitude.
3. With two objects, for the flesh and for the eggs, in view of utlilizing to the best purpose the food generally given to tome poultry.

Each of these specializations naturally demands a particular method and feeding if one wishes to know how best to profit from a certain breed and from the local situation.

The breeding of geese is carried on all over France, but as the writer shows, various kinds of products are demanded of them according to the locality. This has resulted in a variety of breeds named according to the purpose for which they are bred.

The goose produces flesh, grease, liver, feathers and skin. It is essentially

herbivorous and is the sheep among poultry, just as the duck is the pig.

The breeding of geese is easy, feeding not expensive, but the improved breeds, the only ones which are of any interest these days, are not satisfied with pasture only, so that some balance of food is necessary.

Except in the special case of the production of red geese and of hides (Poitu) it is always interesting to accomplish the fattening by cramming and why at the same time the hypertrophy of the liver is examined by a super-cramming. This requires experience which can easily be acquired elsewhere.

M. Chevenard's book is an interesting review of data touching both past and present. History, Breeding, Diseases; everything is treated. The feather-production, which is of but little importance to small breeders, forms the subject of a special chapter.

Guinea-Fowl and Turkeys, Breeds, Breeding, Feeding, Diseases. Pintades et Dindons. Races, Elevage, Alimentation, Maladies. W. Chenevard. 1 vol. in-16 de 150 pages et 17 figures. Prix 7 fr. 50, franco 8 fr. 75. Librairie J.-B. Baillière et Fils, 19, rue Hautefeuille, Paris, VI.

Guinea-fowl, the domestic game, are easy and inexpensive to keep. They have been called upon to play an important part, in climates suitable to them and they are well known for their rusticity and laying capacities. In very cold regions their laying capacity decreases considerably but in spite of this the breeding of guinea-fowl still remains interesting, seeing that efforts are being made, as in Switzerland, to popularize the breed.

The turkey owes its unpopularity in France to two legends. It is said that they are very difficult to rear and in consequence need a great deal of care.

The first of these legends is now denied as it has been discovered that young turkeys owe their first great weakness to the very great consanguinity of their parents. In cases where the eggs come from non-consanguinary, vigorous, healthy birds of the right age, which are covered at a favourable time, they hatch chickens whose rearing is almost as easy as that of hen chicks.

The idea, all too common, that the breeding of turkeys was not remunerative unless one has a run of woods or stubble fields at his disposal tends to become somewhat modified.

Some breeders, such as M. Chevenard, have practiced turkey breeding in large pens and have been very successful. This method has also been adopted in the United States of America, and is now the only method used for industrial breeding purposes.

If local conditions permit of breeding in flocks, as this is practiced more or less in pens, it is desirable that breeding in France should increase to such an extent that it will recover the place which it occupied in the export trade and which was gradually lost to Italy.

The data given in this little book by Mr. Chevenard enables everybody to apply practical principles to breeding both on a large and small scale.

Pigeons. Carrier Pigeons, sporting and fancy. Breeds, Breeding, Diseases, Homing Pigeons. Les Pigeons. Les Pigeons de rapport, de sport et de luxe, Races, élevage, maladies. Les Pigeons voyageurs. W. Chenevard. Préface de R. Fontaine, président d'honneur du Pigeon-Club Français. 1 vol. in-16, de 304 pages avec 65 figures. Prix 15 frs.; franco 16. 50 Librairie J. B. Baillière et Fils, 19, Rue Hautefeuille, Paris-6e.

At the beginning of last century pigeon breeding flourished but since then there has been a considerable decrease and to-day France is dependent on other countries, notably Italy for a great part of her pigeons for table use. Pigeon breeding is nevertheless remunerative. How can this neglect be explained unless it is owing to the ignorance of those who should be interested?

No class of breeding is more simple to conduct provided that a good beginning is made, that is, that one is properly installed, takes good birds and feeds them rationally.

Pigeon breeding might easily become complicated as there are numerous breeds each requiring special attention. One should begin by choosing a breed suitable to the circumstances in which one is placed. This work has been compiled with a view to helping people to make a choice and further to help them in fixing the method of breeding and feeding. The writer classifies each category of pigeons according to utility and breeding. He first compares the carrier pigeons, fancy pigeons and sporting breeds, tries to judge the role and utility of each in order to advise the amateur of the breeder in the choice of a bird which is best suitable to his particular case.

M. Chenevard has availed himself of the advice of the best practitioners and M. Robert Fontaine, the oldest among them, whose authority is universally adknowledged, has read and re-read his work repeatedly. The appreciation of a breed is not necessarily the result of a special taste or of a single interest. This method permits the restoration of a very small number of actual carrier pigeons and of the preservation of the fancy breeds in their correct order.

One cannot however consider the breeding of pigeons these days without applying a number of simple but nevertheless necessary rules. The second part of Mr. Chenevard's work is devoted to the housing of pigeons, the peopling of the cotes, reproduction and breeding. This is confined only to what is essential to success, that is, to obtaining maximum profits. Feeding is treated in a very practical manner.

The third part is devoted to homing pigeons. The following are treated: instinct, the qualities which the pigeon fancier must possess, the cote and its inhabitants, reproduction; exercise and training, flights over land and sea, organization of pigeon breeding in France.

The fourth part deals with the most common diseases and the latest methods of combatting these.

Poultry Husbandry. Morley A. Jull, Senior Poultry Husbandman. Bureau of Animal Industry, V.S. Department of Agriculture. Mc Craw-Hill Book Company, Inc. New York and London, 1930.

Preface:

The purpose intended in the preparation of the material in this book is to convey to its readers some conception of the background of the poultry industry, the fundamental principles involved in various poultry practices and up-to-date information concerning methods of poultry production. The more important economic factors in producing and marketing poultry products are given due consideration.

Success in poultry raising depends largely upon one's knowledge of the business and one's ability to produce and market poultry and poultry products most efficiently. Fundamental principles must be understood to some extent at least before the most economical methods can be practiced intelligently. For this reason the major aspects of poultry production and marketing are discussed, first, in respect to principles involved and, second, in respect to practices to be followed.

The discussion of fundamental principles involved should stimulate further research concerning the problems raised. The results of the various lines of research work are reviewed and an extensive list of literature references is given, so that the investigator, teacher and student each has a ready reference for review purposes.

The discussion of practices to be followed should be of considerable value to extension workers, farmers and commercial poultrymen.

The preparation of the book has been inspired in the spirit of rendering the greatest possible service to the poultry industry.

Credit for quotations, figures, and tables from various sources is given in this book in connection with their usage. Particular mention is made here, however, of the gracious permission of authors and publishers to use material from their copyright works, mention of which is made in page footnotes.

Contents:

Preface. I. The Nature and Uses of Poultry Products; II. The Poultry Industry; III. The Classification, Origin and Early Distribution of the Chicken; IV. The Breeds of Chicken; V. The Structure of the Chicken; VI. The Formation of the Egg; VII. Judging Chickens on the Basis of Standard and Production Qualities; VIII. The Inheritance of Characters; IX. The Inheritance of Egg Production; X. Breeding Practice; XI. Breeding Records; XII. Embryo Development and Hatchability; XIII. Incubation Principles; XIV. Incubation Practice; XV. Brooding Principles and Practice; XVI. Rearing Practice; XVII. Broiler Production; XVIII. Capon Production; XIX. Housing Principles and Practice; XX. Housing Equipment and Appliances; XXI Nutrition; XXII. Digestion and Metabolism; XXIII Nutrient Requirements; XXIV. Feeding Principles; XXV. Feeding Practice; XXVI. Diseases and Parasites and their Control; XXVII. Judging Chicks, Eggs and Dressed Chickens; XXVIII Marketing Eggs; XXIX. Marketing Chickens; XXX. By-products of the Chicken Industry; XXXI. The Economics of Production and Marketing; XXXII. Records and Accounts; XXXIII. Poultry Plant Layouts; Appendix; Literature References; Index.

Progressive Poultry Raising. M. A. Jull, Senior Poultry Husbandman, United States Department of Agriculture. Armour's Livestock Bureau. Edward N. Wentworth, Director. Union stock yards, Chicago, Illinois. 1931.

Foreword.

Poultry and eggs have ranked high as staple foods since earliest history. The increased demand as population sought industrial and urban centers was fundamental in stimulating the growth of the modern marketing system which distributes these products. Outstanding in this marketing service is the part played by refrigeration—both in the transportation and storage of produce. The American packing industry with its splendid refrigation facilities has thus had a prominent part in the efficient handling of these food products; raising the standards of quality and sanitation; sending surplus products to distant consuming centers, and helping to stabilize prices by means of its storage services in times of seasonal surplus. This rising demand and efficiency in distribution have had the direct effect of increasing production.

A sound understanding of the general principles of production is essential for the success of the poultryman. Proper menagement of the flock, regulating supplies, and furnishing the kind of product needed to meet the demand, thus bringing a higher return to those engaged in poultry raising, are phases of the subject treated in this book.

Contents:

Chapter I The Place of the Poultry Industry in American Agriculture. II Breeds and Varieties of Chickens. III Breeding for Egg and Meat Production.

IV Incubation Problems. V Brooding and Rearing Problems. VI Housing. VII Feeding. VIII Turkey Raising IX Duck Raising. X Goose Raising. XI Poultry Diseases. XII Preparing Poultry Products for Market. XIII Marketing Eggs and Poultry. XIV. Prices and Trends in Egg and Poultry Production.

The Houseless Method of Poultry Keeping. Burt W. Heywang and Morley A. Jull, Bureau of Animal Industry, U. S. Department of Agriculture. Poultry Science. 1930, p. 32.

The houseless method of poultry keeping was originated in the Salt River Valley of Arizona several years ago. Because of the mild climate, the customary poultry houses were not regarded as necessary, and several poultrymen tried keeping their layers without houses of any kind. While the commercial poultrymen who use the system seem to be satisfied with it, they have gathered no satisfactory data which could be used for comparison with data obtained from flocks provided with houses. The data presented in this paper were obtained at the United States Poultry Experiment Station, Glendale, Arizona.

Summary. There was less mortality and a faster rate of maturity in the houseless group.

Feed consumption per bird was slightly greater during the „growing" period and slightly less during the fourteen months „laying" period in the houseless group.

Average egg production and average feed cost per dozen eggs produced were nearly identical in both groups.

Hatchability of eggs was slightly lower for the houseless than for the housed group.

Success in keeping poultry without houses after the brooding period is attributed to the light precipitation and the absence of cold weather.

Poultry Education and Research in England and Wales. R. E. Dale, Ministry of Agriculture and Fisheries, London. The Veterinary Journal, 1931, p. 4.

A system of education and research has been established. The organisation of that system is based upon two principles. First, education in poultry husbandry should not be separated from education in other forms of agricultural production. Secondly, poultry research should be associated as closely as possible with research in other branches of agriculture.

In England and Wales there are 14 agricultural colleges or university departments of agriculture. Seventeen farm institutes are conducted by the authorities in England and Wales. The county councils also provide itinerant instruction and advice on a large scale. Last year they employed 53 poultry instructors or instructresses.

The crown of the system is the advanced training which is provided by the National Institute of Poultry Husbandry at the Harper Adams Agricultural College. Poultry research is conducted at several institutions.

EGG LAYING CONTESTS

Problems in Egg Weighing in Relation to Production. Morley A. Jull, Senior Poultry Husbandman, Bureau of Animal Industry, U. S. Department of Agriculture. Poultry Science, 1930, p. 207.

Conclusions:

A point system of scoring the weights of eggs in officially conducted egg

laying contests is developed in connection with which it is suggested that due consideration is given to the problem of differences in marketable value of different size of eggs and to the biological value of the problem of the inheritance of egg weight.

Data have been presented which show definitely that the higher the average egg production per bird the smaller the mean weight of eggs produced annually.

Weighing eggs in grams one day a week may be practiced in determining the approximate mean egg weight of the annual production of a bird.

County Egg Laying Trials in England. Ministry of Agriculture and *Fisheries.* Bulletin no. 17. London. 1930.

Contents:

Introductory. List of County Egg Laying Trials in England Recognized Under the Ministry's Education Grant Regulations, 1920-21 to 1929-30. Model Rules Issued by the Ministery. Table of Methods of Feeding Adopted at Various Trials. County Egg Laying Trials, 1928-29: Summary of Results in Order of Merit. Comparative Statement Showing Summary of Annual Egg Production by Principal Breeds at County Egg Laying Trials, 1920-21 to 1928-29. Graph Illustrating Above Statement. Comparative Statement Showing Average Number of Scoring Eggs Laid Per Bird, Per Month and Per Annum, in All Trials, 1926-27 to 1928-29. Names and Addresses of County Agricultural Organizers and County Poultry Instructors. List of Birds that Won Certificates of Special Merit at County Egg Laying Trials, in 1927-28, with Particulars of Their scores and the Names and Addresses of Their Owners. List of Birds than Won Certificates of Special Merit in 1928-29, with particulars &c. as given for 1927-28.

Summary of the results of breeders entered in Record of Performance in Canada for the year 1929—30, who had completed their records by February 10th. R. W. Zavitz, Supervisor, R. O. P. for Poultry. Ottawa, Feb. 10, 1931.

This is the final summary which will be issued.

Rules and Regulations for the Seventh Utah Intermountain Egg-laying Contest. Byron Alder. Utah State agric. college, Logan, Utah. circ. 89.

The rules and regulations of the Seventh Utah Intermountain Egg-laying Contest which began on November 1, 1930, extending for a period of 51 weeks, are set forth in this circular. A brief discussion is also given on the general care and management which the birds receive while in the contest.

PHYSIOLOGY AND ANATOMY.

Anatomy of Poultry. Ein Beitrag zur Anatomie des Haushuhnes. B. Grzimek. Institüt für Tierzucht der Tierärztlichen Hochschule Berlin. Tierärztliche Rundschau, 1931, p. 287.

The writer is furnishing a poultry museum in Berlin and has taken several photographs with Röntgen rays. Some of these are described in this article. The majority of prepared skeletons show serious anatomical erros which is now proved.

The photographs published of the digestive organs and blood-vessels are the first made of hens.

The article contains numerous anatomical facts but is too long to be summarized.

Differences between Goose and Duck. Ueber osteologische Unterschiede zwischen Gans und Ente. Tierärztliche Rundschau, 1931, p. 233.

The birds are divided according to the breast-bone into Ratitae and Carinatae. The Ratitae cannot fly, the bones contain no air, crista sterni and furcula are absent. Water birds belong to the Carinatae which have a large crista sterni. The breast-bone in Natatores or Lamellirostres is a very broad, flat bone. Geese and ducks can be distinguished by the breast-bone. In ducks the crista sterni reached back to the rear edge of the breast-bone. In the goose it does not reach so far back as it gradually runs into the body of the breast-bone.

Histologic examinations of the small intestine in Birds. A házimadarak középbelének összehasonlító szövettani viszs gálata. E. Istvánffy. Ref. Berliner Tierärztliche Wochenschrift, 1931, p. 375.

The longest villi are in the duodenum where the villi lie close together. The columnar epitel lies in one layer. The Lieberkün's glands here are also regeneratory cell accumulations. In the duck and goose there is a submucosa. The external, longitudinal muscle layer is often double. There are no Brunner glands. The mucous membrane of the Meckel Diverticles in waterfowl is changed into a lymph-apparatus. The small intestine is separated from the large intestine by a mucous membrane fold which is formed by the enlarged muscle layer.

The Vocal-Organ in Cocks. Etude des modifications sexuelles de l'Appareil phonateur der Coq. J. Calvet. Comptes rendus de la Société de Biologie, Tome 107, 1931, p. 132.

The voice of the cock developes simultaneously with the comb. Neither capons nor hens have this voice. With the help of photographs the writer shows the anatomical changes of the throat. It is generally assumed that the syrinx is the vocal organ in birds. This appears to be absolutely incorrect. This only causes vibrations. The glottis in the throat determines the peculiarities of the voice. After tracheotomy the cock loses its typical voice and produces a noise similar to that of the hen.

Microscopic examination of the throat muscles showed great differences in the throats of cocks and capons. These muscles are particularly sentitive to sex differences which explains the differences in the voices.

The Origin of Auditive Vesicules in Embryos. Origine des Vésicules auditives chez un embryon de Poulet omphalo séphale. J. Szepsenwol. Laboratoire d'anatomie, Université de Genève. Comptes rendus de la Société de Biologie, Tome 106, 1931, p. 1199.

The omphalocephalic embryo was obtained by piercing the white of the egg before the egg was placed in the incubator. The embryo showed external signs of the deviation after 52 hours. A detailed description of a microscopic examination of the brain centre is given.

The Skeleton of Canaries. A kanárimadár (Serinus canarius) csontos váza. G. Zimmermann, Anat. Institut der Tierärztliche Hochschule, Budapest. Annales Musei Nationalis Hungarici, 1930, XXVII, p. 38. Berliner Tierärztliche Wochenschrift, 1931, p. 375.

In young birds the bones contain marrow in older birds there is air in the arm-bones and the shin-bone. The number of neck-vertebrae is 14—15, breast vertebrae 7—9. The lumbo-vertebrae (3), sacral-vertebrae (5—6) and the first tail-vertebrae (3—4) run into the os lumbosacrale. There are 7—9 breast-ribs. There are 26 illustrations to the article which contains numerous particulars regarding the skeleton of the canary but it is too long for a short summary to be given.

Development of right ovari in a chicken. Atypische Entwicklung der rechten Eierstocks bei einem Haushuhn-Zwillings-Kücken. Paula Hertwig, Institut für Vererbungsforschung, Berlin-Dahlem-Zeitschrift für Anatomie und Entwicklungsgeschichte, T. 92, p. 740.

In a normal chicken only the left ovary is developed but in the chicken described the ovaries on both sides were still well developed. Even on the fourth day of development there is a clear difference between the left and the right germ-epithelium. Benoit's statement that the right gonade might be a rudimentary testicle is incorrect. If the left ovary is removed from a chicken a few days after hatching the right ovary will still develop.

In hens which had been castrated at an older age Domm saw develop an ovotestis or real testicle on the right.

Action of the Ovary Hormone. Action de l'Hormone ovarienne sur les Coqs et les Poules des trois Formes (bleues, blanches et noires) de la Race andalouse. F. Caridroit et V. Réquier. Comptes rendus de la Société de Biologie, Tome 107, p. 1250.

A. Action in blue hens. Ovariectomy results in a capon the feathers of which are like those of the cock.
B. Action in blue cocks. In the place of the pointed cock feathers round hen-feathers develop.
C. Action in grey cocks. The colour of the capons is practically all white.
D. Action in black hens. The feathers become similar to those of a black cock.
E. Black cocks become just as black hens. The ovary hormone therefore influences the black pigment. It is possible that there are two kinds of black pigment one of which disappears when the ovary hormone is present.

The hormonic action of the Testicule of Drakes. Etude de l'action hormonique du Testicule sur le Pénis des Canards. Ch. Champy. Comptes rendus de la Société de Biologie, Tome 107, 1931, p. 605.

After castration the penis of drakes becomes smaller unless 5 grams of the testicles remain. The development of the penis of drakes and the comb of cocks shows differences. The penis consist of dense fibrous tissue, the comb of cocks of less dense fibrous tissue.

Consumption of Oxygen by the Retina in Fowls. Sur la consummâtion en Oxygène de la Rétine chez les embryons de Poule. Kwanichi Kiyohara. Institut de physiologie de la Faculté de médecine Nagasaki, Japon. Comptes rendus de la Société de Biologie, Tome 106, 1931, p. 920.

The consumption of oxygen by the retina increases from the 7th day of the incubation up to the 11th day on which the maximum is reached. After the 12th day it begins to decrease and at the end of the hatching period it is about the same as that of the hen. The visual cells appear on the 11th day and there appears to be a close connection between these symptoms.

Sexual Changes in a Pigeon. Ueber einen seltenen Fall einer Geschlechtsanomalie bei einer Taube. Prof. Dr. W. Krüger. Anatomisches Institut der Tierärztliche Hochschule, Berlin. Berliner Tierärztliche Wochenschrift, 1931, p. 356.

A pigeon which had laid three eggs changed later and behaved as a cock-pigeon. A microscopical examination revealed the fact that there were no egg follicles in the ovary. Further, near the ovary, the remains of the primary kidneys were found, so-called par ovaries. The right ovary-rudiment was greatly enlarged and was in process of becoming a testicle.

Explanatory illustrations are given.

Age and Spurs. Prof. Cornevin. Ecole Vétérinaire, Lyon. Chasse êt Pêche.

The first signs of spurs in cocks begin to show at the age of 4½ to 5 months. At this time a small protusion appears which at the age of 7 months has developed into a little spur of about 3 mm. When the cock is a year old the spur is 15 mm. long and is quite straight. At two years old it measures 25—27 mm. and is slightly bent, generally upwards but sometimes downwards. When the cock is 3 years old the spurs are from 36 to 38 mm. long and are strongly curved, usually upwards. At the age of 4 the spur is 50 to 54 mm. and at 5 years 62—65 mm.

These measurements are naturally given as an average. They also vary according to breed. So, for instance, breeds with feathered legs usually have shorter spurs than those with unfeathered legs. Bantams are naturally excluded from this article. Usually they have small, needle-shaped spurs, which give no indication of the age of the bird.

This figures will give some indication as to the age of a cock; experts however will be able to make a good guess without these indications.

TOME IV. APRIL 1932 No. 4

INTERNATIONAL REVIEW OF POULTRY SCIENCE

LIBRARY
RECEIVED
JUL 15 1932
U. S. Department of Agriculture

OFFICIAL ORGAN OF THE

WORLD'S POULTRY SCIENCE ASSOCIATION

EDITOR
Dr. B. J. C. TE HENNEPE
ROTTERDAM (Holland)

This Review is free to all members of the World's Poultry Science Association.

All subscriptions should be sent to the Editor: Dr. B. J. C. te Hennepe, Rotterdam, or to the Secretary-Treasurer: Dr. G. F. Heuser, Cornell University, Ithaca, N.Y., U.S.A.

SUBSCRIPTIONS.

$ 5.00 annually in advance.

The **personal membership** of the W.P.S.A. amounts to $5.00 per year.
For **affiliated societies** ,, ,, $25.00 per year.

ADVERTISEMENT RATES.

One page, per issue	$12.00
Half page, per issue	$7.00

Special attention is called for

BREEDERS' ADVERTISEMENTS

which are now fixed on **$10.00 per full page, during 1 year.**

TOME IV. No. 4

INTERNATIONAL REVIEW OF POULTRY SCIENCE

OFFICIAL ORGAN OF THE

WORLD'S POULTRY SCIENCE ASSOCIATION

EDITOR:
DR. B. J. C. TE HENNEPE
ROTTERDAM (Holland)

Printed in Great Britain
by
H. R GRUBB, LTD., PRINTERS, CROYDON.

Rotterdam,

April, 1932.

To the Members.

Owing to the recent unfavourable circumstances the publication of this number, the last of Tome IV., has been delayed.

We hope to be able to continue the publication of the Review even though this cannot take place quarterly as has been the case up to now.

As soon as circumstances permit the Review will again be published regularly.

The Editor,

Dr. te Hennepe.

THE INTERNATIONAL REVIEW OF POULTRY SCIENCE IS EXCHANGED WITH THE FOLLOWING 85 JOURNALS. WHO FOLLOWS ?

AUSTRIA. NUTZGEFLUEGELFREUND, Franz Josefs Kai 7-9, Wien I.
GEFLUEGELWIRTSCHAFT, Lichtenauergasse 5, Wien II.
OESTERREICHISCHE TIERARZT, Wallnerstrasse 6, Wien.
OESTERREICHISCHES ZENTRALBLATT FUER TIER- UND PFLANZENZUCHT, Berggasse 31, Wien IX.
ZENTRALBLATT FUER KLEINTIERZUCHT, Riemergasse no. 6, Wien I.

AUSTRALIA. THE AUSTRALIAN VETERINARY JOURNAL, University of Sydney, Faculty of Veterinary Science.
AUSTRALASIAN POULTRY WORLD, 78a Victoria Str., Melbourne.
THE JOURNAL OF THE DEPARTMENT OF AGRICULTURE OF SOUTH AUSTRALIA, Victoria Square, Adelaide.
POULTRY, Sydney, N.S.W. 32.
VICTORIAN POULTRY JOURNAL, Melbourne, Victoria.

BELGIUM. AVISELECT, Rue Emm. Mertens 29, Bruxelles, Woluwe.
CULTURA, Dr. de Bisschop, 12 Hertogin Straat, Antwerpen.
DE KRAAIER, Gebr. Leens, Boom.
LAND, TUIN EN NEERHOF, Baliestraat 97, Gent.
HET VLAAMSCH DIERGENEESKUNDIG TIJDSCHRIFT, Brusselschesteenweg 625, Gent.
HET VLAAMSCH PLUIMVEEBLAD, Brussel-Woluwe.

CANADA. THE CANADA POULTRYMAN, 618 Homer Street, Vancouver.
THE CANADIAN POULTRY JOURNAL, 3 Blythwood Crescent, Toronto 12.
THE CANADIAN POULTRY REVIEW, 184 Adelaide Str., W., Toronto.

CZECHO-SLOVAKIA. PRAGER ARCHIV FUR TIERMEDIZIN UND VERGLEICHENDE PATHOLOGIE, Dr. K. Zaruba, Leitmeritz, Böhmen·
VESTNIK CESKOSLOVENSKE AKADEMIE ZEMEDELSKE, Dr. Eduard Reich, Prague.

ENGLAND. CHANTICLEER, E. Kirsch, Normandy, near Guildford.
EGGS, Rudgwick, Sussex.
THE FEATHERED WORLD, 9, Arundel Street, Strand, London, W.C.2.
HARPER ADAMS POULTRY JOURNAL, Newport.
LANCASHIRE UTILITY POULTRY SOCIETY'S REPORT, 22, Chapel Walks, Preston, Lancashire.
MEMOIRS UNIVERSITY OF CAMBRIDGE, Department of Agriculture, Cambridge.
NATIONAL POULTRY JOURNAL, Milford, Surrey.
POULTRY WORLD, 4, Carmelite Street, London, E.C.4.
THE JOURNAL OF THE MINISTRY OF AGRICULTURE, 10, Whitehall Place, London.
UTILITY RECORD, Official Organ of the National Utility Poultry Society, 53, Victoria Street, London, S.W.1.
THE VETERINARY BULLETIN, Veterinary Laboratory, Ministry of Agriculture and Fisheries, Weybridge, Surrey.

FRANCE. LE PETIT JOURNAL AGRICOLE, 61 Rue Lafayette, Paris.
LA REVUE AVICOLE, 34 Rue de Lille, Paris.

GERMANY. ARCHIV FUER GEFLUEGELKUNDE, Kaiser Wilhelmstr. 66, Berlin-Nieder Schönhausen.
DEUTSCHE GEFLUEGEL-ZEITUNG, Vaihingen a. d. Enz.
DEUTSCHE LANDWIRTSCHAFTLICHE GEFLUEGEL-ZEITUNG, Steinmetzstr. 2, Berlin.
EIER-BOERSE, Nürnbergerstr. 28, Berlin.
GEFLUEGEL—WELT, Georgstrasze 38/33, Hannover.
GEFLUEGEL—BOERSE, Solomonstr. 16, Leipzig.
GEFLUEGEL—FARMER, Lütznerstrasse 29, Leipzig.
NORDDEUTSCHER GEFLUEGELHOF, Nordstrasse 5, Oldenburg i. Olbg.
ZUECHTUNGSKUNDE, Nikolausberger Weg 9, Gottingen.

HOLLAND. AVICULTURA, Misset, Doetinchem.
BEDRIJFS-PLUIMVEEHOUDER, Doetinchem.
SCHAKELS, Maasstraat 106 II, Amsterdam (Z.)
TIJDSCHRIFT VOOR DIERGENEESKUNDE, Prins Mauritslaan 9, Den Haag.

HUNGARIA. STATISTIKAI HAVI KOZLEMENYEK, Keleti Kàroly, U. 7, Parterre 14, Budapest.

INDIA. THE INDIAN POULTRY GAZETTE, Narayangunj, E. Bengal.
THE INDIAN VETERINARY JOURNAL, P. Srinivasa Rao, Madras.

IRISH FREE STATE. JOURNAL OF THE DEPARTMENT OF AGRICULTURE, Dublin, C. 17.

ITALIE. BASSA CORTE, Salita Inf. S. Tecla 36, Genova.
RIVISTA DI AVICULTURA, Via A. saffi, 26, Genova.

JAPAN. JOURNAL OF THE JAPANESE SOCIETY OF VETERINARY SCIENCE, Prof. Naoshi Nitta, Faculty of Agriculture, Imperial University, Komaba, Tokyo.

MEXICO. MEXICO AVICOLA.

NETHERLANDS-EAST-INDIA. LANDBOUW EN VEETEELT, Petjenongan 72, Batavia-Centrum.
N. I. BLADEN VOOR DIERGENEESKUNDE, Bataviasche weg 54, Buitenzorg.

NORWAY. TIDSKRIFT FOR FJAERFAEAVL, Raadhusgaten, 9 IiI, 10-3, Oslo.

PHILIPPINE ISLANDS. PHILIPPINE POULTRY JOURNAL, Agricultural College, Laguna.

POLAND. THE POLISH ECONOMIST, Electoralna 2, Warsaw.

ROUMANIA. REVISTA AVICOLA, D-lui Adrian Lazar Cluj, Str. Nemoranduliu 22.

SCOTLAND. THE SCOTTISH JOURNAL OF AGRICULTURE, Dept. of Agriculture, His Majesty's Stationery Office, Edinburgh.

SOUTH AFRICA. BOERDERIJ IN SUID-AFRICA, Landbouw Department, Pretoria.
THE JOURNAL OF THE S. A. VETERINARY MEDICAL ASSOCIATION, 61, Simmondsstreet, Johannesburg.
THE S. A. POULTRY MAGAZINE, Whiteco House, Box 286, Bloemfontein, S.

SPAIN. MUNDO AVICOLA, Arenys de Mar, Barcelona.

SWEDEN. SVERIGES FJäDERFäAVELS FöRENINGS TIDSKRIFT, Garvaregatan 7, Stockholm.

SWITZERLAND. DIE TIERWELT, Zofingen.

UNITED STATES OF AMERICA. ALABAMA NATIONAL EGG LAYING DEMONSTRATION PROGRESS REPORT, Alabama Polytechnic Institute, Auburn, Alabama.
THE BABY CHICK, 1230 West Washington Boulevard, Chicago.
EXPERIMENT STATION RECORD, U.S. Department of Agriculture, Washington, D.C.
GOLDEN BUFFS, New Albany, Indiana Bruce W. Ulsh, Owner.
HATCHERY TRIBUNE, Mount Morris, Ill.
HINTS TO POULTRYMEN, Agric. Exp. Station, New Brunswick, N.J.
INTERNATIONAL BABY CHICK NEWS, 3223 Troost Ave., Kansas City, Mo.
NEW ENGLAND POULTRYMAN, 4 Park Street, 2. Boston, Mass.
NEW JERSEY AGRICULTURE, Rutgers University, New Brunswick, N. J.
OHIO AGRICULTURAL EXPERIMENT STATION, BIMONTHLY BULLETIN, Wooster, Ohio.
POULTRY CRAFTSMAN, 327 Towne Avenue, Los Angeles, California.
POULTRY CULTURE, 2607 North Boston Place, Tulsa, Oklahoma.
POULTRY ITEM, Sellersville, P.A.
POULTRY PROJECT BULLETIN, Mich. State College of Agriculture, East Lansing, Michigan.
POULTRY SCIENCE, Dr. J. Holmes Martin, 730 Rose Street, Lexington, Ky.
POULTRY TRIBUNE, Mount Morris, Ill.
RELIABLE POULTRY JOURNAL, Dayton, Ohio.
U.S. EGG AND POULTRY MAGAZINE, 110 North Franklin Street, Chicago.

BREEDING

Culling of Young Poultry and of Layers. A. A. Grebenshchikov and N. P. Churilov. Under the title of the U.S.S.R. Poultry Research Institute of the Soiousptize product. State Agricultural Publishing House. " Telkolkhosguis." U.S.S.R. Moskva, 1931. Circulation 25,000 copies, 40 pages, 23 illustrations.

In the introduction it is told that 1932 will be the last year of performing the Five Year Plan (in four years). That now in all collective as well as state poultry farms, the work must be rationalised, and as a means of the rationalisation, culling out the non-producing hens is recommended.

In the first part " Why is it important to cull young poultry and layers " it is told, that in every flock bad producers may be found, that after culling is made, the curve of the per cent. of production goes up, and that when the flocks are culled, an economy of food is noted.

The book further on is divided into two parts (1) Culling of young poultry, and (2) Culling the layers. Characters and changes found on good and poor chicks and layers and methods of applying the tests and determining the quality of a bird are given. The brochure contains five charts for culling : (1) day-old chicks ; (2) two or four week old chicks ; (3) determining whether the hen is laying or not ; (4) showing how the hen went on with her egg production up to the time of culling, and (5) showing which rate of production may be expected from the hen.

Inheritance of Body Weight in domestic Fowl. Dr. Miguel Manresa. Philippine Poultry Journal.

Although extensive investigations have been done on the inheritance of body-size in poultry, our knowledge of the method of transmission of this character is far from being complete. Dr. Nanresa reviews a bulletin on this subject by Dr. Waters. A total of 2,966 birds, comprising two different breeds, namely, Light Brahmas and Single Comb White Leghorns, as well as their crosses were subjected to this investigation for a period of over ten years.

The results of these experiments very clearly demonstrated that such quantitative character as the size of the bird is inherited in accordance with known laws of heredity. The results are due to the operation of two pairs of factors which determine the size of the individuals and that both parent stocks are pure for these factors.

At ten months of age a definite ratio exists between the size of males and females. This ratio is expressed by the conversion factor 1·28. This relationship does not hold true when the birds are younger than ten months of age. Certain breeds grow much faster than others.

The phenomenon of hybrid vigour is observed when two different varieties, breeds, strains or families of animals or plants are crossed. The term heterosis was given by Shull to this phenomenon.

The Inheritance of Shank-feathering in the domestic Fowl. W. V. Lambert and C. W. Knox. Poultry Science, 9, 1929. No. 1, pp. 51-64.

In a study of the inheritance of shank feathering at the Iowa Experiment Station, crosses were made between Black Langshans and White Plymouth Rocks and Buff Orpingtons. All F_1 chicks and adults were shank feathered, but the degree of feathering was less than in the Langshan parent. F_1 and back-cross data supported the conclusion that there were two dominant factors, either of which was capable of producing shank feathering. The two factors were inherited independently of each other, the C factor, and sex, but there was a deviation of $10{\cdot}4 \pm 3{\cdot}5$ per cent. from the expected percentage in the offspring in case of independent inheritance of one of the factors for shank feathering and the W factor for skin colour.

Studies on Inheritance in Pigeons.—VIII, "Porcupine" Pigeons. L. J. Cole and L. E. Hawkins. Journal of Heredity, 21, 1930. No. 2, pp. 50-60, figs. 8.

In continuing this series from the Wisconsin Experiment Station (E. S. R., 64, p. 25), a type of feather structure in pigeons in which the barbs and barbules developed imperfectly is described as previously noted (E. S. R., 63, p. 26). This condition appeared to be recessive to the normal.

The Sex-Linked Method in Poultry Breeding. Journal of the Ministry of Agriculture. Jan., 1932.

Most poultry keepers are aware of the research work carried out by Prof. Punnett and others at Cambridge University. This work has shown that certain external characters of poultry chicks, easily distinguished at birth by an ordinary observer, are related to sex.

This knowledge, which enables the poultry breeder to distinguish with certainty the sex of the chicks of certain crosses on the day that they are hatched, is recognised as of distinct value, not only to the breeder, but also to the vendor and purchaser of day-old chicks.

The Ministry's publication on the subject has now been revised by Prof. Punnett and re-issued as Bulletin No. 38. Opportunity has been taken to refer to recent developments, including the "Cambar," a new breed that automatically exhibits sex-linkage. The stock of this breed is at present in the hands of the Ministry and is being worked up in order to increase its fecundity.

The Bulletin indicates a number of the most suitable matings, and contains two coloured plates that clearly show for eight different crosses the difference in appearance of the male and female chicks at hatching.

Sex-Linked Crosses. How to tell the Sex of the Day-old Chick. A. P. Thompson. The Feathered World, Talbot House, Arundel Street, London, 1931. With 2 coloured plates and 9 photographs.

Contents :

I. What is sex-linkage? Advantages and disadvantages. Which cross do we advise. The question of egg colour. The Cambar sex-linkage within the breed. A list of sex-linked crosses.
II. Sex-linked crosses, some suggestions and advice by Prof. F. B. Hutt.
III. The coloured plate of chicks, by W. Powell-Owen.
IV. Telling the sex of day-olds in White Leghorn Crosses by Prof. D. C. Warren.
V. A sex-linked character in ducks by Prof. R. C. Punnett.
VI. The last chapter gives a description of various sex-linked crosses.

Sex Determination at Hatching. H. M. Molyneux. Harper Adams Util. Poultry Journal, 15 (1929-30), No. 1, pp. 5-8.

In a study of the identification of the sex of chicks at hatching from a cross of a Black Minorca male with White Leghorn females, it was possible to determine correctly the sex of only 68 per cent. on the basis of shank colour. Eye colour, rate of tail feathering, and down colour did not behave as sex-linked characters.

In a cross of a Black Leghorn male with Barred Plymouth Rock females, it was possible to identify the sex at hatching correctly as the pullets had black heads while the cockerels showed a small white or cream spot on the top of the head. The pullets developed into a uniform flock of pure black birds with dark shanks, eyes, and beaks, and a small single comb.

The sex was determined at hatching in only 56 per cent. of the chicks from the cross Black Leghorn male with Cuckoo Leghorn females, but it appeared that the parents were not from pure breeding strains.

From an attempt to sex White Leghorn chicks by the rudimentary sexual organ in the vent of males, it was concluded that the organ was not sufficiently distinct at hatching but was quite apparent at six weeks of age. Ducklings were accurately sexed at hatching by examination of the vent.

Colour Chimeras in the domestic Fowl. C. W. Knox. Journal of Heredity, Vol 22, 1931.

In the F generation from Black Langshans × White Plymouth Rocks the writer observed two half-side-mosaics. In one case the mutation was in the skin colour and in the other one of the white legs had a yellow stripe. In another crossing a case occurred in which a hen had one yellow and one green leg. The writer attributes the cause to somatic mutations or non-disjuntions.

A New Dilution Factor in Pigeons. W. Christie and C. Wriedt. Hereditas, 15, 1931. (Ref. Züchtungskunde, Dec., 1931.

The following breeds are found among the Archangel pigeons :—

1. Copper-Jay with black wings—the other feathers are red. 2. Copper-Jay with blue wings—the other feathers are red. 3. Gold-Jay with black wings—the other feathers are yellow. 4. Gold-Jay with blue wings—the other feathers are yellow. 5. Mirror Jay with white wings—the other feathers are red. 6. Mirror Jay with white wings—the other feathers are yellow.

The young plumage in all breeds is red, sometimes with yellow wings. The writers crossed the types 1, 3 and 6 with single coloured blacks and red (recessive red !) and in accordance with Horlacker (1930) came to the conclusion that the jay marking is often recessive against black and red. Three completely reversed types of jay showed the black factor. F_1 birds of various colours were re-crossed with single coloured birds. As was the case in the F_1 only few birds occurred with the jay marking ; it is probable that the single coloured birds used for the crossing were heterozygot. A recessive dilution factor in pigeons is known to the writers, and to Cole, of black into grey, red into yellow, brown (recessive red) into diluted chocolate. In the black-gold-jay yellow, thus the dilution of red, and black occur as the intensive colour. It appeared now that the gold jay has a dilution factor d which is probably an allelomorph to the known D-d. Their respective action is $D\text{-}d_1\text{-}d$.

Bantam Genetics. Distribution of Traits in a Sebright-Mille Fleur Cross. C. H. Danforth. Journal of Heredity, Vol. 20, 1929.

In the course of 5-6 generations something over 200 descendants were born from an initial crossing of Mille Fleur cock Sebright hen. Systematic crossings were not carried out after the second generation so that it concerns more a question of incidental results. The individual feathers of Golden Sebrights are gold-brown pigmented, with black edges. The Mille Fleur feather is tri-coloured : gold-brown, white and black. The F_1, were uniform with dominant Sebright marking in most parts. In the later generations single coloured (black and yellow) and multi-coloured feathers appeared with varied combinations of the typical markings. At least two factors are necessary for the formation of hen plumage, one for the formation of the hormon and one for the reaction type of the tissue, moreover, modification factors are often present which stipulate the degree of the appearing male plumage. Form of the comb, leg-feathers, brachydactylie, and size of the body, were also discussed.

Dominant and Recessif White in Poultry. Dominantes und Rezessives Weisz bei Hühnern. Dr. A. C. and Dr. A. L. Hagedoorn. Soesterberg, Archiv für Geflügelkunde, Tome 2, p. 22.

The writers have made various experiments with crossings of white and coloured poultry. The variations in the formation of the white colour are described. Through certain crossings white Barnevelder hens were obtained which laid brown eggs.

The methods applied for obtaining white poultry from coloured breeds are discussed. The object is quickest obtained by commencing with accidental white products which have occurred in coloured breeds and which belong to the recessive white class.

Hatchability Inherited. D. H. Reid. Texas Agricultural College. International Baby Chick News, August 6, 1931.

Facts summarised.

To close this paper, I am going to quote the summary given by Hayes and Sanborne of Massachusetts :

1. Hatching power is more constant from year to year in the same hen than is fertility.
2. Hatchability is more constant from year to year in the same male than is fertility.
3. Hatching power gives evidence of being transmitted from mother to daughter.
4. The hatching power of a male cannot be judged by his dam's hatching record.
5. Hatching power gives evidence of transmission from sire to daughter.
6. Hatchability is evidently an inherited trait. High hatchability is dependent upon one dominant inheritance gene. Both male and female parent govern the hatching record, thus obscuring the true genetic composition of either parent.
7. Genetically pure hens for high hatchability may be discovered through their own hatching record. Genetically pure males for high hatchability can be distinguished from males heterozyous for the factor only, by the progeny test combined with mating tests. Both the mating and the progeny tests should be used for choosing males to improve the flock in hatchability.

Incubation with Oxygen. Ueber die Methode der Künstlichen Brutūng unter Verwendung von Sauerstoff. Prof. Dr. Süchting and Dr. Deines. Agrikulturchemisches Institut der forstl. Hoxhschule, Hannover-Münden. Archiv für Geflügelkunde, Tome 2, p. 2.

The writer has investigated Becker's method by which oxygen is introduced into the incubator during hatching.

Neither in theory nor in practice were any advantages discovered in the oxygen method as compared with the ordinary methods.

The writer obtained the best hatching results when the eggs were repeatedly turned during the incubation period and the temperature kept at 38° C.

Disinfection of Incubators. Desinfektion der Brutmaschine. Dr. Wehner, Director Poultry Experiment Station, Erlangen. Geflügelwirtschaft, December 12, 1931.

From the nineteenth day the Buckeye incubators are sprayed twice daily with a 1 : 1,000 solution of chinosol at 50° C. This also occurs during the hatching process. When the hatching is finished the whole incubator is again disinfected with a chinosol solution. While disinfecting, the ventilator should be kept running so that the disinfectant reaches the chick-fluff better.

Livability Tests. Hatching Tribune, February, 1932.

Many hatcheries will run livability tests in February. This is a good way to start the hatching season.

To run these tests, a representative number of eggs is hatched from each flock supplying the hatchery with hatching eggs. These chicks are then brooded in separate decks of a battery brooder, under similar conditions. The chicks which do not make a good showing immediately indicate that the particular flock from which they come, need some attention. It may be a change in management or perhaps bacillary white diarrhœa is rampant in the flock. If a further check up reveals that bacillary white diarrhœa is present, the flock should either be tested and the reactors removed, or the flock stricken from the list.

Those hatcherymen who have followed this testing practice for several years speak very highly of it. It not only increases their profit, but it also eliminates many bothersome adjustments.

NUTRITION

VITAMINS

Studies of the Vitamin Potency of Cod-liver-oils. XXI. The Stimulation of Reproduction by Fat-soluble Vitamins. A. D. Holmes, A. W. Doolittle and W. B. Moore. Journal of the American Pharmaceutical Association, 16, 1927.

Experiments are made with F_5 Rhode Islands. The results were as follows :—

	Control hens	Cod-liver Oil per day			
		¼ gr.	½ gr.	1 gr.	2 gr.
Production	38·3%	47·0%	51·2%	49·2%	56·6%
Blood spots in eggs ..	4·4%	3·2%	2·6%	2·0%	2·0%
Average weight of eggs	57·1 gr.	58·6 gr.	57·9 gr.	58·8 gr.	58·0 gr.
Fertility	97·6%	97·1%	95·1%	95·5%	96·2%
Hatchability	53·9%	63·6%	63·3%	68·8%	72·1%
Vitality of chicks ..	42·0%	77·0%	92·0%	85·0%	91·0%

Conclusions :

Production, hatchability and vitality of chicks are increased by gifts of cod-liver oil. Fertility and average weight of eggs are also increased. The number of eggs with blood spots is decreased. At the end of the experiments the birds which received cod-liver oil were heavier and mortality was less than those of the control birds. The eggs of the birds fed with cod-liver oil contained a higher degree of vitamin A than the eggs of the control birds.

The Variation in Colour-test Value of Commercial Samples of Cod-liver Oil. F. J. Dyer and F. Wokes. Quarterly Journal of Pharmacy and Pharmacology, 3, 1930, No. 3, pp. 417-426. (Ref. Experimental Station Record, 1931, p. 709.)

Twenty-four samples of cod-liver oil purchased in the open market (England) from retailers were examined by the antimony trichloride colour test in a Lovibond tintometer under the following conditions : " A cylindrical cell 1 cm. in diameter, 0·2 c.c. of a 20 per cent. v/v solution of the oil in chloroform mixed with 2 c.c. of antimony trichloride reagent, intensity of blue colour taken at 30 seconds after mixing."

Individual determinations were made by two observers, and the average of the two results was taken as the colour test value of the oil. The values obtained ranged from three to nine, with an average of 5·7. In comparison with

these values, a series of 16 oils received direct from the importers and found satisfactory in vitamin A content, as determined by feeding experiments, ranged in value from 4·5 to 13, with an average of 8·2. From these relative values it is considered that the consumer of cod-liver oil in England is receiving a product containing on an average only two-thirds of the activity as measured by the colour test to be found in satisfactory samples of oil as they enter the country.

Of the 24 samples in the present study, six which were stored in amber bottles averaged 6·2 in colour values, 17 in white glass bottles averaged 5·6, and one in a blue glass bottle 3·5. The use of blue bottles is considered particularly objectionable in that it leads to a false sense of security on account of the well-known protection afforded by amber bottles. On the basis of the findings reported, it is suggested that a satisfactory sample of cod-liver oil should give a colour test value of not less than four to five and that oils giving lower values should be regarded as of inferior quality. The practice of converting colour tests into so-called biological units by the employment of an arbitrary factor is thought unjustifiable if no feeding tests are given in support of such conclusions.

The Fat-soluble Vitamin Requirements of the Chick. I. The Vitamin A and Vitamin D Content of Fish Meal and Meat Meal. W. D. McFarlane, W. R. Graham, F. Richardson. Biochemical Laboratory, Ontario Agricultural College, Gullph. The Biochemical Journal, 1931, p. 350.

Summary :

1. A sample of white fish meal when fed at a level of 15 per cent. in a diet composed of marmite and white rice was found to contain sufficient vitamin A and vitamin D to promote normal growth of chicks until eight weeks of age. A sample of meat meal was found to contain little or no vitamin A or vitamin D when compared with fish meal.

2. The conclusion of Plimmer *et al* (1927), that as little as 0·5 per cent. of cod-liver oil of good quantity is sufficient to rear chicks to maturity is based on the assumption that the fish meal used in their diets contained little or no fat-soluble vitamins. This assumption, for reasons discussed in the text, is believed to be erroneous. An experiment is described which shows that the amount of high grade medicinal cod-liver oil required to rear chicks, in the laboratory to eight weeks of age is in excess of 1 per cent.

3. Some factor, other than the vitamin D, calcium or inorganic phosphorus content of the diet of the chick, has been found profoundly to affect the concentration of inorganic phosphorus in the blood serum of chicks during the first eight weeks of growth.

On the Action of Cod-liver Oil and Irradiated Preparations in Rickets. Ueber die Wirksamkeit von Dorschlebertran und bestrahlten Präparaten bei Rachitis. Prof. E. Poulsson Staatliches Vitamins. Institut at Oslo. Deutsche Medizinische Wochenschrift, 1931, p. 665.

In 1924 Stembock and Hesz discovered that as a result of ultra-violet irradiation fats obtained an antirachitic quality. This also depended on the activation of ergosterol, a substance prepared in 1889 by the French chemist Tanret from Secale cornutum. Irradiated ergosterin is called synthetic vitamin D. Whether this is identical with the antirachitic factor in cod-liver oil is still uncertain. The activity of industrial preparations varies.

In 1928 and 1929 Barnes, Brady and James carried out comparative experiments on 216 children. In 95 per cent. of the cases cod-liver oil cured rachitis. Irradiated ergosterol cured only 44 per cent. of the cases. The results were no better than in untreated subjects.

In 223 cases De Sanctis and Craig arrived at the following conclusion : Cod-liver oil prevented rickets in 97 of the 100 cases, viosterol in 77 per cent. of the cases. Viosterol appeared to be less active than cod-liver oil.

Massengale and Nuszmeyer obtained the following results with chickens : In concentrated and in diluted solutions activated ergosterol appeared to be less active than cod-liver oil.

The difference in results can be explained from the conditions under which the experiments take place.

In experiments on rats an artificially pure D avitamiosis is created while other vitamins are present. In the case of children it often happens too little vitamin D and A are given in the food so that the remedy should include both. Cod-liver oil to which irradiated ergosterol has been added should therefore be given. In the experiments carried out by Barnes, Brady and James this preparation did not appear to give any better results than ordinary cod-liver oil.

Other medical remedies are already familiar examples of the way in which nature furnishes compounds which cannot be replaced by their individual components. None of the many alkaloids of opium can be used as a substitute for opium itself. And the full effect of digitalis can only be obtained by using the leaves themselves or preparations which contain all the active glycosides together.

The Action of Activated Ergosterol in the Chicken, I, II. O. N. Massengale and M. Nussmeier. Journal of Biology and Chemistry, 87, 1930, No. 2, pp. 415-426. (Ref. Experiment Station Record, 1931, p. 760.) Two parts are presented.

I. *The effect on the calcium and inorganic phosphorus of the blood serum* (pp. 415-422).—In this study the authors used five lots of four White Leghorn cockerels each, averaging 18 weeks of age. Four lots received a basal ration of yellow corn meal, wheat gluten, casein, linseed meal, and salt 79 : 10 : 5 : 5 : 1, while the fifth lot received a rickets-producing ration. Lot 1 received no mineral supplement, while, replacing a like amount of corn, lot 2 was fed 6 per cent. of calcium carbonate ; lot 3, 1 per cent. of calcium carbonate and 5 per cent. of sodium phosphate ; and lot 4, 6 per cent. of calcium phosphate. The approximate calcium-phosphorus ratios in the respective rations were 0·32 : 1, 8 : 1, 0·38 : 1, 1·6 : 1, and 5 : 1. Weekly determinations were made for calcium and phosphorus in the blood serum of each bird for a period of eight weeks. At the end of this period 4 per cent. of activated ergosterol, potency 1,000 times that of average cod-liver oil, was added to each ration, and the calcium and phosphorus of the blood determined 2, 5, 10, 15, and 35 days after the addition of the ergosterol.

The calcium in the blood serum of the birds in lot 2 increased during the first week and remained above normal for eight weeks, while the inorganic phosphorus decreased rapidly during the first three weeks and then remained approximately stationary. Adding ergosterol brought about a marked increase in calcium, but only a slight increase in phosphorus. The calcium content of the blood of the birds in lot 5 remained normal for about five weeks, but there was a steady decrease in phosphorus. Adding ergosterol to this ration caused the calcium and phosphorus to become about normal. Within 48 hours after the addition of ergosterol to a high calcium rickets-producing ration there was a marked change in the calcium of the blood serum. Both the calcium and phosphorus remained about normal when the calcium-phosphorus ratio was 1·6 : 1,

and the addition of ergosterol had no marked effect on either until 15 to 35 days after, from when an increase in serum calcium occurred. When the ration was low in both calcium and phosphorus these elements decreased in the blood serum and when ergosterol was added there was a marked increase in calcium but only a slight increase in phosphorus. After 35 days the calcium was approximately normal, with the phosphorus still subnormal.

II. *The prevention of leg weakness* (pp. 423-426).—Single Comb White Leghorn chicks were divided into five lots of ten each and fed a basal ration of yellow corn, half skim milk powder, wheat bran, linseed meal, wheat gluten, calcium carbonate, and salt 56 : 10 : 10 : 10 : 10 : 3 : 1. Lot 1 received the basal ration only ; lot 2, a supplement of 2 per cent. of cod-liver oil. In lot 3, half of the chicks received 0·02 per cent. of activated ergosterol and the other half the same amount of ergosterol diluted to 2 per cent. with corn oil ; lot 4, half of the chicks 0·2 per cent. of activated ergosterol and the other half the same amount diluted to 2 per cent. with corn oil ; and lot 5, 2 per cent. of activated ergosterol. The birds were housed so they had no access to direct sunlight and were fed their respective rations for ten weeks, at which time the birds were killed and the percentage of ash in the bones determined.

The average percentages of bone ash per bird in the respective lots were 39·89, 47·22, 41·21, 44·39, and 47·23. In spite of the low ash content, the birds in lot 1 were not suffering from severe leg weakness. The birds receiving the vitamin D equivalent of 2 per cent. of cod-liver oil in the form of activated ergosterol had an appreciably lower ash content of bone than the birds receiving cod-liver oil. However, the birds receiving ergosterol had considerably more ash in the bones than the birds receiving no vitamin D supplement.

It is concluded that activated ergosterol, either in concentrated or dilute solutions was less efficient for preventing leg weakness in chicks than the rat equivalent amount of cod-liver oil.

Irradiated Ergosterol and Calcium-free Diet: Effect on Calcium and Phosphorus Metabolism. E. Watchorn. Biochemical Journal, 24, 1930, No. 5, pp. 1560-1563. (Ref. Experiment Station Report, 1931, p. 95.)

The previously noted investigation of the effects of massive doses of irradiated ergosterol on the calcium and phosphorus metabolism of rats has been extended to similar balance studies on diets low in calcium and high in phosphorus and *vice versa*. The Steenbock-Black rachitic diet was used as the basal diet, with the addition of calcium carbonate and inorganic phosphate, respectively. The general technique was the same as in the preceding study, including preliminary, excess irradiated ergosterol, and recovery periods.

The effects of irradiated ergosterol on the group receiving high calcium and low phosphorus were similar to those of the previous study. The rats lost weight rapidly, the food intake was decreased, and the retention of calcium and phosphorus was lowered markedly, with a corresponding increase in urinary calcium. On the calcium-free diet the animals continued to gain weight, the phosphorus retention was unaffected, but there was an increased elimination of calcium by the kidney, thus producing a negative balance. " Such a loss of calcium, in the absence of calcium from the diet, can only mean that it is being lost from the bones or tissues. This action of large doses of irradiated ergosterol has been suggested from time to time by various workers and apparently exists whether calcium is present in the diet or not. But for the calcification of tissues the large doses of vitamin D are in themselves insufficient and need to be combined with a fairly high calcium intake. The action of irradiated ergosterol in the latter circumstance clearly requires further investigation."

Hypervitaminosis in Fowls. E. J. King and G. E. Hall. Biochem. Ztschr., 229 (1930), No. 4-6, pp. 315, 322. (Ref. Experiment Station Record, 1931, p.96.)

The pathological effects of an overdosage of irradiated ergosterol on fowls are reported and summarised as no abnormal deposits of calcium in the organs, but a weakened deformed condition of the bones accompanied by a decrease in bone phosphatase and also in kidney phosphatase.

Parallelity between Antirachitic and toxic Factor in Radiated Ergosterin. Uber die Parallelität zwischen antirachitischem und toxischem Faktor in bestrahltem Ergosterin. O. Schultz and W. Meyer. Klin. Woch. Nr., 29, 1930.

An attendant symptom of the harm done by over-dosing with radiated ergosterin is the increase of the inorganic phosphor. It has been ascertained that there is no parallelity between the antirachitic and the toxic factor. It is not possible therefore to add a standardisation of vitamin D by chemical means.

Consumption of Oxygen by Animals Poisoned with Vigantol. Uber den Sauerstoffverbrauch vigantol-vergifteter Tiere. Nitschke and Schneider. Klin. Woch., 1931, No. 44.

Guinea-pigs and rabbits which had been poisoned with large doses of vigantol showed an increase of 20 per cent. to 40 per cent. use of oxygen.

Sclerosis of the Aorta. Uber die Vitamin-D-Sklerose der Aorta, besonders ihre Anfänge. R. Nicolle. Z. f. experim. Medizin, 70, 1930.

Test animals of various kinds were given large doses of different kinds of vitamin D preparations. They all died of Kachexia. Medium sized doses also caused primary and secondary calcination.

Experimental Studies Concerning the Nervous Symptoms of Poisoning with Vitamin D. Experimentelle Studien über die nervösen Erscheinungen der Vergiftung mit Vitamin D. Hoff. Klinische Wochenschirift, 1930, No. 31.

Vigantol poisoning in dogs and rabbits caused cerebral disturbances, which could be histologically observed. Castration and hypophysoectomy bring the damage to the blood-vessels and bones to light, while thyroidoectomy brings the cerebral symptoms to light. These are : paralysis, spasms, tonic-clonic cramp.

Local Calcination of Tissues after Subcutaneous Injection of Radiated Ergosterine. Uber die lokale Gewebsverkalkung nach subkutaner Zufuhr von bestrahltem Ergosterin. v. Brand Th. and F. Holz. Hoppe-Seylers Z. Physiol. Chemie, Bd. 195, 1931.

It has been proved that the poisonous action of vitamin D preparations depends on their content of calcinous factors, which are not identical with vitamin D. After subcutaneous injections of vitamin D solutions, local calcina-

tion has arisen around the place where the injections were given. The symptoms of sickness are more intense after the feeding of strong mixtures of radiated ergosterine than after subcutaneous injection. Experiments will now be carried out with a view to ascertaining whether the vitamin D free calcinous factor, causes the same action. The writers applied the following tests :—

A.	Daily	injections	of	Soya Oil.				
B.	,,	,,	,,	Ergosterin dissolved in S. Oil				
C.	,,	,,	,,	13	To.	Gr. of the	preparations	W.64
D.	,,	,,	,,	17	,,	Gr. ,, ,,	,,	K.W.32
E.	,,	,,	,,	50	,,	Gr. ,, ,,	,,	NN.
F.	,,	,,	,,	100	,,	Gr. ,, ,,	,,	N.

In series A and B calcination of the tissues never occurred at the place of injection, but did take place in the series C to J. It is, therefore, a question of a specific action of a converted product of the radiated ergosterin. As calination also took place after the use of W. 64 b, a preparation which loses its antirachitic action after heating, it was assumed that the calcinous factor causes the calcination.

A Study of the Antimony trichloride Colour Reaction for Vitamin A, III, IV. E. R. Norris and A. E. Church. Journal of Biology and Chemistry, 89, 1930, Nos. 1, pp. 421-435, figs., 8 ; 2, pp. 589-598, figs. 3. (Ref. Experiment Station Record, 1931, p. 803.

III.—The Effect of Concentration of Reagent used, and the Stability of the Chromogenic Substance to light.

Attention is called to the differences in the concentrations of antimony trichloride used by various workers in the colour test for vitamin A, and a series of experiments is reported showing the influence of the concentration of antimony trichloride on the colour produced by various amounts of cod-liver oil and an unsaponifiable extract of cod-liver oil. The antimony trichloride was used in concentrations of 1·7, 4·3, 10·9, 19·2, and 36·3 gm. per 100 c.c. of solution. The first four concentrations were used at the temperature of an ice and water bath and the other at room temperature. Cod-liver oil was diluted with anhydrous chloroform to concentrations of 50, 25, 12·5, 6·25, 3·125, 1·56, and 0·78 per cent. The technique outlined in previous papers was followed, readings being taken at 30 seconds with a Lovibond tintometer.

At low colour values the variation of the observed colour with different concentrations of antimony trichloride were slight, but at colour values above five blue units relatively large variations in colour were produced with varying concentrations of the antimony trichloride.

With high concentrations of oil the observed colours at 30 seconds appeared to be dependent upon the light used for the measurement of the colour whether reflected or direct and of low or high intensity. The most marked difference was the more rapid development of red with the more intense light, with a tendency to a more rapid fading of the blue.

To determine which wave lengths of the visible spectrum are most destructive of the chromogenic substance of cod-liver oil, samples of a chloroform solution of the unsaponifiable matter of cod-liver oil were exposed under constant temperature to non-filtered light and light filtered, respectively, through blue, green, and red filters transmitting wave lengths of less than 520, between 500 and 650, and more than 595 $\mu\mu$. As determined colourimetrically there was marked destruction of the chromogenic substance when exposed to white or blue light and practically no change with green and red light, showing that the destruction is due to light of wave length less than 500 $\mu\mu$. Similar results were obtained with a 25 per cent. solution of cod-liver oil and with another series in which the unsaponifiable extract of cod-liver oil was used. In this series one tube was left in darkness and the other three

exposed to light through amber and blue filters and no filter respectively. The amber filter, transmitting light of wave length greater than 515 $\mu\mu$ afforded almost complete protection.

Other experiments are reported showing that the rate of destruction on exposure to light is only slightly increased by increasing the temperature of the solution, but markedly increased by the presence of oxygen.

IV. The Source of Vitamin B Complex in the biological Assay of Vitamin A and the Stability of Vitamin A and of the Chromogenic substance in various Diluting Oils.

Further data are given, showing the errors which may be introduced into biological assays for vitamin A, at least in cod-liver oil, if enough of the vitamin B complex is not present. It is emphasised that " simply feeding a definite amount of yeast, as 10 per cent. of the diet, does not always insure ample supply of the factors of the vitamin B complex nor give comparable results. From the symptoms obtained, it would seem that dried yeast varies most in the heat-labile factor, vitamin B. If the source of vitamin B complex is sufficiently great a premature flattening of the growth curve in testing for vitamin A after a period of depletion was not observed, but if the diet contains some substance having a physiological action, such as traces of isoamylamine or chlorine, not sufficiently balanced by the source of vitamin B complex, the animal may seem to be normal for a few weeks before the effects become apparent. Near the critical point of balance between the source of vitamin B complex and the source of toxic substance, considerable individual variation is often observed, partly due to differences of appetite and food intake."

Another source of error in testing liver oils or their unsaponifiable extracts for vitamin A is the possible destruction of the vitamin by the oil used as diluent. Data are reported showing the instability of the chromogenic substance in various oils. The substance proved to be very unstable in peanut oil quite unstable in olive oil, and fairly stable in coconut oil, although different samples of the coconut oil were found to vary in this respect, some giving considerable destruction. The coconut oil also has the disadvantage of being a solid when cooled. The addition of a small amount of hydroquinone was found to prevent the destruction of vitamin A with peanut oil but not entirely with olive oil.

Quantitative Differentiation of Vitamins A and D. II. H. C. Sherman and H. K. Stiebeling. Journal of Biology and Chemistry, 88, 1930, No. 3, pp. 683-693.

This paper supplements an earlier one on the same subject by describing in detail the technique which has been developed in the senior author's laboratory for the quantitative determination of vitamins A and D.

The technique for A is essentially the same as described previously by Sherman and Burtis. It is noted that in an analysis of almost 200 experiments in which the rate of gain was approximately the standard unit of 3 gm. per week, shortening the test period from eight weeks to five would have resulted in only slightly less regular finding and a somewhat higher average rate of gain per week. When quantitative studies of the effect of some treatment on vitamin A are being made, it is recommended that carefully matched rats from the same litter be fed the treated and untreated material in such daily amounts as have been shown to contain one unit of vitamin A in the case of the untreated material. In estimating the vitamin A values of two or more materials which promote growth at rates differing from each other and from the standard, the use is recommended of such standards as have been proposed by Batchelder as noted above.

In discussing the technique for determining vitamin D, the authors call attention to the fact that rats from the Sherman stock diet B, when placed on a diet supposedly adequate except for vitamin D, continue to gain on the average from 6 to 8 gm. per week for about three months before growth ceases, while on a diet otherwise adequate but free from A. Cessation of growth usually occurs

in from four to five weeks. The relatively high storage of vitamin D on this diet, as has been noted previously, makes the extent of calcification a more satisfactory quantitative measure of vitamin D than growth.

The basal vitamin D-free diet and general technique have been described previously. Quantitative comparisons of the vitamin D content of foods are made by finding the amounts necessary to induce a degree of calcification midway between the minimum values obtained without added D and the maximum values obtained with an abundance of supplementary vitamin D. " It should be emphasised that this method is feasible only when the groups of animals used for testing vitamin D can be compared with two control groups each containing representatives from the same litters and matched in sex and weight, one receiving no added vitamin D, the other receiving a fixed liberal supply. Probably animals from at least five or more litters should be used for obtaining the average figures for each group."

The Chemical Constitution of the Carotenoid Pigments and the Relation of Carotene to Vitamin A.—A Review. J. M. Gulland. Journal of the Society of Chemical Industries, Chemistry and Industry, 49, 1930, No. 41, pp. 839-847, figs. 2. (Ref. Experiment Station Record, 1931, p. 801.)

This review supplements one by Drummond on the progress of vitamin A research up to the end of 1929. After a brief account of the present status of belief concerning the relationship of vitamin A to carotene, the chemical constitution of the synthetic polyenes is discussed, followed by the natural carotenoid pigments, including the pigments of saffron, lycopin, carotene, xanthophyll, lutein, fucoxanthin, physalien, and capsanthin. An extensive list of literature references is appended.

Some Observations on Avitaminosis A in Fowls. J. R. Hutchison, Veterinary Research Station, Glenfield, N.S.W. The Australian Veterinary Journal, September, 1931, p. 93.

Conclusion :

1. The experiments recorded confirm the work of Beach as to the occurrence of a deficiency disease in fowls associated with lack of any known source of vitamin A.

2. That the origin of the complaint induced was really diet deficiency was proved by the provision of either green-stuff or cod-liver oil, no other treatment being adopted.

3. Natural cases of the disease have occurred during dry times when green feed was not available.

4. On supplying the lacking vitamin, recovery was prompt and was accompanied, in the case of laying birds, by marked increase in egg production.

5. Where it was impossible to obtain greenstuff, it was found that the administration of cod-liver oil, either by daily doses of one cubic centimetre or by the addition of 1 per cent. of this to the mash, produced the desired results.

6. The condition can be induced in adult fowls, although the period taken is much longer than in the case of growing birds.

7. Male birds may be affected, but the period taken appears to be longer than in the case of the hens in natural outbreaks. This is probably associated with the fact that there is a considerable demand for vitamin A for egg production on account of the fact that egg yolk contains considerable quantities of this substance.

Carotine and Vitamin A. The Conversion of Carotene into Vitamin A by Fowl. Norman S. Capper, T. M. W. McKiggin, J. H. Prentice, Donald Currie Laboratories and the Department of Agriculture, Queen's University, Belfast. The Biochemical Journal, 1931, p. 265.

Summary:

Chickens were successfully reared to maturity on a synthetic vitamin A free diet to which either carotene or cod-liver oil concentrate was added. The carotene was not stored in the liver unchanged but was converted into vitamin A characterised by the blue colour given with SC Cl_3 absorption band 610-630 millimicron and the presence of an absorption band at 325 millimicron.

The beaks and shanks of chickens, which had become colourless through the absence of carotenoids from the diet did not become more yellow when carotene was added to it.

The poultry disease known as visceral gout would appear to be related to vitamin A deficiency and to be curable by the administration either of carotene or of cod-liver oil.

The vitamin A content of hen liver oils is shown to be very high and the vitamin A requirements of the fowl large.

The Toxic Effect of Fish liver Oils, and the Action of Vitamin B. E. R. Norris and A. E. Church. Journal of Biology and Chemistry, 89 (1930), No. 1, pp. 437-449, figs. 4. (Ref. Experiment Station Record, 1931, p. 95.)

The literature reporting occasional toxic effects of cod-liver oils when used as the source of vitamin A in animal feeding experiments is reviewed briefly, and the results are reported of a systematic study to determine the cause of this toxicity.

It was found that some cod-liver oils produce symptoms similar to vitamin B deficiency when fed in relatively large amounts to rats on a diet containing as high as 10 per cent. of yeast, but that the toxicity can be counteracted by feeding still larger amounts of yeast. That the toxic effect was not due to excess of vitamin A was ruled out by the fact that there was no correlation between the A content and toxicity of different samples of oil. That excess vitamin D was not responsible was indicated by the failure of additional vitamin D in the form of irradiated ergosterol to produce similar symptoms.

Continued small doses of isoamylamine and of choline in amounts which may be found in cod-liver oil produced similar symptoms which were prevented or cured by additional yeast. It is thought, however, that the effect of yeast is not specific for these two bases.

Cannibalism and Vitamins. Het Vlaamsche Pluimvee blad, November 7, 1931.

At the fifteenth International Congress for Anthropology held in Paris in September, Dr. Marie and G. Zaborowski submitted an important note under the title " Cannibalism and Vitamins."

The following is a summary of their opinions :—

It often happens in a flock that one hen begins to pluck out the back feathers of its neighbour and that all the other hens follow suit, with the result that to all appearances the whole flock has been attacked by an epidemic. The writers attribute these symptoms to bad feeding and state that a cure can be effected by giving foods rich in those vitamins which promote oxidation and which contain much calcium.

Human beings sometimes suffer from a bad habit called onychopagy, (nailbiting), which the writers consider is equivalent to the symptoms in hens described above.

The writers proved that both in the case of children and adults the cause of this was insufficient nourishment and that an absolute cure was effected by feeding vitamins. Other diseases are also attributed to insufficient nourishment, and can be cured by an increase in vitamin consumption.

Studies on A-Avitaminosis in Chickens, I, II. O. Seifried. Journal of Experimental Medicine, 52, 1930, No. 4, pp. 519-531, plates 3 ; pp. 533-538, plates 2, figs. 2.

The first of these two contributions from the Rockefeller Institute for Medical Research deals with lesions of the respiratory tract and their relation to some infectious diseases and the second with lesions of the upper alimentary tract and their relation to some infectious diseases.

The principal tissue changes found in the respiratory tract of chickens caused by a vitamin A deficiency in the food were, first, an atrophy and degeneration of the lining mucous membrane epithelium as well as of the epithelium of the mucous membrane glands. " This process is followed or accompanied by a replacement or substitution of the degenerating original epithelium of these parts by a squamous stratified keratinizing epithelium. This newly formed epithelium develops from the primitive columnar epithelium and divides and grows very rapidly. . . . The lesions, which first take place on the surface epithelium and then in the glands, show only minor differences. . . . The specific histological lesions make it possible to differentiate between A-avitaminosis and some infectious diseases of the respiratory tract."

When fowls were placed on a diet lacking in vitamin A, lesions appeared in the upper alimentary tract and were confined largely to the mucous glands and their ducts. " Histologically it is shown that the original epithelium becomes replaced by a stratified squamous keratinizing epithelium, and that secondary infections are relatively common. The ducts of the glands may be blocked, leading to distention with secretions and necrotic materials. These lesions macroscopically resemble very closely certain stages of fowl pox, and the two conditions can be separated only by histological examination. It is pointed out that these lesions produced by a lack of vitamin A may enable bacteria and other viruses to enter the body."

MINERALS

The Calcium-Phosphorus Ratio of the Tibiæ of Growing Chicks. A. D. Holmes, M. G. Pigott, P. A. Campbell. The E. L. Patch Cy., Boston. The Journal of Biological Chemistry, 1931, p. 187.

Summary.

Twenty-nine pens of Rhode Island Red chicks have been grown in commercial battery brooders from hatching to nine weeks of age. They were fed the all mash type of ration. The different mashes varied in protein, mineral, and vitamin content. At weekly intervals the chicks and mash were weighed. When the chicks were three, six, and nine weeks old, five representative chicks were selected from each pen. They were killed and the tibiæ were removed. The left tibiæ were dried, measured (length and diameter), weighed, ashed, and the ash analysed for calcium and phosphorus.

The calcium-phosphorus ratio of the tibiæ of the nine weeks old chicks was compared with the ash content of the rations, the calcium-phosphorus ratio of the ration, the rate of growth of the chick, and the ash content of the tibiæ.

The results of this study indicate that there is no correlation between the calcium-phosphorus ratio of the tibiæ of nine weeks old chicks with the per cent. of ash in the ration, with the calcium-phosphorus ratio of the ration, with the body weight of the chicks, or with the ash present in the tibiæ. Thus it would seem that calcium and phosphorus are deposited in a fairly constant ratio regardless of the completeness or incompleteness of bone development.

The Lack of Relationship between the Development and Cure of Rickets and the Inorganic Phosphorus Concentration of the Blood. A. F. Hess, M. Weinstock, H. Rivkin, J. Gross. Department of Pathology, College of Physicians and Surgeons, Columbia University, New York. The Journal of Biological Chemistry, Vol. 87, 1930, p. 37.

Summary.

Rickets may be associated with normal concentrations of inorganic phosphorus in the blood. On the addition of small amounts of irradiated ergosterol the inorganic phosphorus is raised to the normal level without accompanying signs of healing of the rachitic lesion. Animals which receive supplements of cod-liver oil do not attain as high a concentration of phosphorus but do show definite evidences of healing. Of course, if full doses of irradiated ergosterol are given, prevention or cure can be relied upon. Irradiation may elaborate a factor which increases the inorganic phosphorus in the blood, quite apart from any antirachitic action.

This paradoxical phenomena—a rise of inorganic phosphorus unaccompanied by a healing of the epiphyses—shows that although rickets usually is associated with a decrease of the inorganic phosphorus of the blood, this diminution cannot be regarded as an essential or inherent feature in the pathogenesis or the healing of this disorder.

In addition to the systemic disturbance which is characteristic of rickets there is probably a local disturbance at the epiphyses which prevents the anchorage of calcium and phosphorus in the cartilage and in the bones.

Salt as the Sole Mineral. Successful New Chick Mashes from Northern Ireland. Dr. Scott Robertson. Feathered World, August 21, 1931.

Dr. Scott Robertson, Director of the Northern Ireland Experimental Station, in one of the most striking papers given at the Harper Adams Conference, showed that very remarkable growth results could be obtained by rearing chickens on the ration detailed below.

This ration and the results must be accepted with due caution, for conditions may not be precisely similar in other cases. It should be noted that oyster shell is given to the chicks from the start (and presumably limestone would do as well), and it should not be inferred from the mash that common salt is necessarily the only mineral that need be given. Not every poultry farmer can offer his chicks, for example, fresh grass and runs. Dr. Scott Robertson's successful chick mash was as follows :—

Dry Mash Ration consisting of Bran, two parts by weight ; Maizemeal, one part by weight ; Sharps, one part by weight ; Sussex Gr. Oats, 1 part by weight, and either Common Salt (in the proportion of eight ounces (half-pound) to every 100 lbs. of mash. Water to drink. Or Extracted Soya Bean Meal 18 per cent. (9 per cent. if no grain ration is given). Separated milk to drink. In addition the chicks were given grain feed, oyster shell *ad. lib.* and access to fresh grass runs.

The chicks on this ration not only weighed considerably heavier, but they started laying at much earlier an age than those unprovided with either salt or separated milk. And they could not be described as " forced," as they weighed heavier at maturity. In his original experiments Professor Robertson had used a complicated mineral mixture, but by a series of eliminating trials extending over seven years he found that salt was the only mineral the chicks actually required, with, of course, the addition of lime, which they obtained from the oyster shell.

The chicks he reared on grass runs with the ration containing separated milk attained greater weights than those which were sold to a professional fattener and spent the last fortnight on a special fattening diet in batteries. Separated milk was far cheaper than dried milk or buttermilk, and preferable to whole milk. It was important to feed it fresh and to keep the utensils scrupulously clean. With regard to salt, it was best to mix such a small amount as eight ounces first with one of the ingredients of the mash and then add this mixture to the rest of the mash.

Capt. Halnan stressed the importance of not feeding more than 1 per cent. of salt, and, in reply to a question, Professor Scott Robertson said that if the rations were fed wet, and not dry, it might be possible to dissolve the salt first in the water before mixing it with the mash.

Extracted soya bean meal had been used in the experiments in place of fish meal on the grounds of economy, as it was very much cheaper. The price varied between £12 and £18 a ton. If fish meal was used, there was no need in any case to add salt, as the best brands of fish meal contained 2 per cent. of salt. In fact, the laying ration upon which the chicks were put when they came into lay at the Northern Ireland Experimental Station was as follows :—

Bran, 2 parts by weight.
Maize meal, 2 parts.
Sharps, 4 parts.
Sussex ground oats, 1 part.
Fish meal, 10 per cent.

The laying records were most satisfactory—in many cases over 200 eggs per annum.

Professor Scott Robertson said that he was perfectly satisfied from his own results over seven years and the experiments of others that his rearing rations could be confidently recommended. The only point he was not satisfied with was whether it was necessary to use the high percentages of soya bean meal or fish meal, or whether they could be reduced on the grounds of economy.

In order to assist small poultry-keepers he had also tried an experiment with cheap feeding for laying mashes.

He had compared the laying records of a pen fed on the standard laying mash given above, in which the egg average was 174 per bird, with a pen fed on a diet consisting of potatoes 50 per cent., maize 25 per cent., oats 25 per cent., in which the average egg production was 138 eggs per bird. He had fed a further pen on the latter ration with the addition of separated milk, and the result was 164 eggs per bird. This showed a very close approximation to the first pen, indicating that a very inexpensive feed supplemented by separated milk gave satisfactory results.

Dr. C. Crowther warmly supported the statements of Prof. Robertson. He had been carrying out very similar experiments with pigs, and had almost identical results. He also had started with a complicated mineral mixture, and had eventually found that salt and limestone were the only two necessary to supplement the basal cereals. The old theory of the animal protein being superior to the vegetable protein (in this case soya bean meal) was largely exploded for the prolificacy of pigs reared on this ration, quite apart from their tremendous superiority in weight, was positively startling. He had seven sows whose litters had never averaged less than sixteen pigs, and in one case over twenty pigs.

He felt sure that the time had come for economy in the poultry industry and we must concentrate on cheap and simple rations.

Influence of Calcium Chloride in the Nutrition of Chicks. L'Influence du chlorure de calcium dans l'Alimentation des Poussins. Malkus. Recueil de médecine vétérinaire de l' Ecole d'Alfort, Tome 107, p. 625.

The author gives a description of the use of calcium chloride in medicine. A dose of 50 centigrams has a favourable influence on the growth of chicks. There must be intervals between the doses or the growth stops.

If sodium chloride is mixed with the calcium chloride the action is more favourable.

Calcium Metabolism. G. D. Buckner, J. H. Martin, W. M. Insko. American Journal of Physiology, 1930, p. 692.

By increasing the content of calcium carbonate in a food consisting of yellow maize, milk and cod-liver oil both the general condition and the laying capacity of hens are improved.

The Feeding of Iodine to Poultry. Prof. Dr. Joh. Schmidt, Leipzig. Deutsche Tierärztliche Wochenschrift, 1931, p. 662.

The writer arrived at the following conclusions :—

1. The significance of iodine for animal metabolism is not yet sufficiently well known. The need for iodine varies considerably in each individual and is dependent on various circumstances (climate, soil, season). Some organs possess the power of storing iodine (Thyroid gland).

2. Hens are not very sensitive to iodine. It was not possible to cause iodimus by large doses administered over long periods.

3. The ovarial function in hens is influenced by iodine. If medium doses are administered the eggs become smaller and lighter and if the doses are increased laying ceases. Shortly after stopping the doses of iodine laying begins again.

4. If iodine is fed the result is an excretion of iodine from the eggs.

Feeding Iodine to Poultry. S.A. Poultry Magazine and Smallholder, June, 1931.

The Director for Veterinary Services states :—

" To the best of our knowledge there is absolutely no benefit to be derived from supplementing the normal iodine content for fowls' rations with pure iodine or iodine salts as the amount of iodine required by fowls is sufficiently subscribed in the green feed and mash they receive. There is, however, a possibility, supported by some evidence, that the practice may even be harmful, In these circumstances it would seem best not to make a change till more evidence is available."

Potassium Iodide in Poultry Farming. A. I. Malan. The Journal of the S.A. Veterinary Medical Association, May, 1931.

Iodine in the form of potassium iodide was given to ten groups of white leghorn hens and the egg production registered for two periods of four months each. Control groups were duly kept and it was found that the egg production of the groups receiving the potassium iodide was not significantly different from that of those on the basal ration only. Indeed, in several cases the groups receiving KI did not do so well as the the control groups.

During the breeding season, egg fertility was studied in the groups receiving KI and in the control groups. No differences were observed. There was no reason for believing that the basal ration was iodine deficient.

Iodine in Poultry. J. B. Orr, A. Crichton and W. Middleton. The Veterinary Record, Vol. IX, No. 48, November 30, 1929.

During a period of three months hens were given 0·30 grams of iodine daily without any special symptoms developing. When the dose was increased to 0·3L grams, the hens suffered from watering of the eyes.

GENERAL

A Comparison of Wet Mash, Dry Mash and a Combination of Both in the Feeding of Laying Pullets. J.·G. Rhynehart, " Eggs," Vol. XXV, August 12 and 19, 1931.

Two separate tests comparing wet mash, dry mash and a combination of both in the feeding of laying pullets are reported. The average total egg production per pullet in both tests was lowest in the case of the birds fed on wet mash alone, and approximately similar from the other two lots.

The percentage of second grade eggs was highest from the pullets fed on wet mash and approximately similar from the other two lots.

The value of the eggs laid was highest from the birds fed on the combination of wet and dry mash and lowest from the birds fed on wet mash only. As, however, the cost of feeding was highest for the combined system of feeding, the net value of the eggs produced by the birds so fed was only slightly greater than from the birds fed on dry mash only.

The cost of food per dozen eggs produced was lowest in respect of the dry mash lot, and highest for the wet mash. Notwithstanding this, the net value of the eggs produced by the birds fed on dry mash only was, as stated above, slightly, but not significantly, less than from the combined wet and dry mash feeding. This was due to the fact that the birds fed on the combined system laid more heavily than those fed on dry mash only, during the winter months when prices of eggs were highest.

It was found that while production during the period from October to end of March was highest from the birds fed on the combined wet and dry system, the birds fed on dry mash alone produced most eggs from March onwards to the end of the tests in September. In view of this, it is suggested that the combination of wet and dry mash feeding may be particularly advantageous during the winter months.

The body weights of the birds were more satisfactorily maintained where wet mash was fed than where dry mash alone was used. The inclusion of wet mash towards the end of the pullet year may therefore be advantageous to keep up body weight for sustained egg production during the second year's laying.

Dry Mash is Best. Canadian Poultry Review, August, 1931.

The superiority of the dry mash as a feed for poultry over either a wet mash or a combined dry and wet mash is clearly shown in a test conducted during the past four years at the Cap Rouge Experimental Station of the Federal Department of Agriculture.

These tests showed that while feed cost slightly more in the dry mash ration, the increase in egg production from flocks of similar size was so substantial that they resulted in a net saving in the cost of producing a dozen of eggs of 16 cents.

The laying flock fed the dry mash numbered 88 birds, producing a total of 3,872 eggs, which sold for a total value of $235.32 ; while the cost of the dry mash fed was $71.04, making the average cost per dozen 22 cents.

With a flock of 81 birds fed a wet mash, production totalled 2,420 eggs, having a selling value of $137.68, while the feed cost $67.92, making the cost of eggs per dozen 38 cents.

—Information Service Publications Branch, Dept. of Agri., Ottawa.

Recommendations for Feeding Pullets and Hens Formulated at Conference of New England Colleges, October 3, 1931. New England Poultryman, October 15, 1931.

200 lbs. Coarse yellow corn meal.
100 lbs. Wheat bran.
100 lbs. Wheat flour middlings.
100 lbs. Ground oats, 38-40 lbs. per bushel.
50 lbs. Meat scraps, not less than 50 per cent. protein.
25 lbs. Fish meal, not less than 50 per cent. protein.
25 lbs. Alfalfa leaf meal, not more than 20 per cent. fibre.
25 lbs. Dried skim milk or dried buttermilk.
15 lbs. Calcium carbonate (ground oyster shell or ground limestone with a content of not less than 96 per cent. calcium carbonate).
5 lbs. Common salt.

645 lbs.

100 lbs. Yellow corn, whole or cracked.
100 lbs. Wheat.

1. Dry mash should be kept before the birds constantly in hoppers or troughs that can be and are kept clean and free from litter, dirt or filth. Hard grains may be fed in similar hoppers or troughs. The amount will vary with the breed, the rate of production, the weather, and possibly other factors. If hens leave any one of the grains in the scratch feed, use less of this grain.

2. On account of the scarcity of barley and the quality of oats this year, the above formula is recommended. However, the grain mixture may be changed to include oats or barley when prices and quality warrant it, providing approximately one-half is composed of yellow corn.

3. Whole corn is recommended because there are certain vitamin losses in cracking and furthermore, the feeder is better able to check on quality. This presupposes that pullets have been taught to eat whole corn on the range before being installed in the laying house.

4. Cod-liver oil is a valuable supplement that should be added to the ration during the winter months, at the rate of not more than one pint per 100 pounds of mash, or nearly one pint per 100 hens per week. It should be fed the year round to hens kept in confinement. If cod-liver meal is used in lieu of oil, it should constitute 2 per cent. of the mash. Care should be exercised in securing meal and oil from reliable sources. Both should be biologically tested for vitamins and contain not more than 3 per cent. free fatty acid.

5. Suggestions for those who wish to feed the following supplements : To each 100 hens, feed germinated oats daily, three pounds dry weight, mixed with one to two pounds of semi-solid buttermilk, or its equivalent in powdered or fluid milk, and one-eighth pint of cod-liver oil, providing oil is not incorporated in the mash or scratch feed.

6. Well cured and preserved alfalfa, clover or soya bean hay (approximately five pounds per 100 hens daily) may be fed to advantage, the leaves only being the valuable portion for poultry.

7. The Conference strongly advocates the use of good, clean, wholesome poultry feeds.

Chick Feeding Recommendations Formulated at Conference of New England Colleges, October 3, 1931.

Chick Feed.

200 lbs. Coarse yellow corn meal.
100 lbs. Wheat bran.
100 lbs. Wheat flour middlings.
100 lbs. Ground oats or oat groats.
50 lbs. Meat scraps, not less than 50 per cent. protein.
50 lbs. Dried skim milk or dried buttermilk.
25 lbs. Fish meal, not less than 50 per cent. protein.
25 lbs. Alfalfa leaf meal, not more than 20 per cent. fibre.
15 lbs. Calcium carbonate (ground oyster shell or ground limestone with a content of not less than 96 per cent. calcium carbonate).
5 lbs. Common salt.

670 lbs.

Chick Feed.

200 lbs. Yellow cracked corn.
100 lbs. Wheat.

1. The mash mixture above is the regular laying mash adapted for chicks by the addition of 25 lbs. of dried milk. In other words, 4 lbs. of dried milk added to each 100 lbs. of laying mash. The addition of the extra milk may be omitted when liquid or other form of milk is fed separately.

2. Mash alone should be fed the first four weeks and thereafter a mixture of wheat and cracked corn should be added to the ration. This mixture should be placed in troughs or hoppers.

3. The use of cod-liver oil or cod-liver meal is recommended. In general, cod-liver oil should constitute not more than 1 per cent. of the mash or cod-liver meal 2 per cent. Care should be exercised in securing the meal and oil from reliable sources. Both should be biologically tested for vitamins and contain not more than 3 per cent. free fatty acid.

4. Whole corn should be included in the ration when the chicks are from three to four months old in order that they may become accustomed to it before being installed in winter quarters.

5. For economical and sanitary reasons all feed should be placed, from the beginning, in no-waste hoppers or troughs on wire feeding platforms. An abundance of hopper space is imperative—meaning by this that hopper space should be sufficient for more than half the chicks to eat at any one time.

6. Poultrymen are urged to include in their feeding schedule certain systematic sanitary programmes, details of which can be secured from their Agricultural College. Clean up and clean out the brooder houses frequently. Dampness and filth facilitate the growth of coccidia, so clean often enough to keep the floor and litter perfectly dry.

7. Best results are obtained by growing chicks on clean, grass ranges, preferably alfalfa or clover, at the rate of not more than 500 chicks per acre. After the disposal of cockerels, this means not more than 250 pullets per acre. The smaller the units the better—100 to 125 pullets should be the maximum. The growing units should be at least 100-ft. apart on the range.

8. To insure an ample supply of green feed, the growing of rape, cabbage, kale, swiss chard, or other green crops is recommended, especially for fall use when the range is less likely to meet all requirements of developing pullets.

Nutritive Requirements of Poultry. Eggs, April 8, 1931.

Conclusion of experiments in Aberdeen and Belfast: A supplement of salt (NaCl) is essential for adequate growth and health in chickens fed on a ration of cereals and soya bean meal.

Under the conditions of these experiments, sulphur, iron oxide and potassium iodide can be omitted without any bad effect. It is, however, possible that under different conditions or in different districts a different result might have been obtained. Consequently it will be necessary to repeat the tests at different centres.

The results on egg-laying are suggestive, but it would be premature to draw conclusions until more extensive trials have been made.

Poultry Experiments at the Matanuska Station. H. W. Alberts. Alaska Statistical Report, 1929, p. 32.

A scratch ration composed of cracked corn, sunflower seed, and wheat, and a mash of ground peas, ground charcoal, grit, oyster shell, and crushed eggshell were fed to a flock of Rose Comb Buff Leghorns, consisting of 15 hens and 15 pullets. On December 25, three hens began to lay and averaged one egg per day until February 16, when the flock averaged four eggs daily to March 18. From the latter date to September 1, the average of the flock was 17 eggs per day, and from September 2 to 30, ten eggs per day. Production declined rapidly during the latter part of September.

Poultry Studies in Oklahoma. Oklahoma Statistical Report. 1927-1930, pp. 87-94, 96, 162, 180, 181, figs. 6.

Grain Sorghums are Good Poultry Feeds. R. Penquite.

A number of experiments are reported.

A series of tests were conducted to determine the comparative values for egg production of rations composed of grain sorghums as the principal cereal, to determine the effect of various feeds on the vitality, mobility, and duration of life of the spermatozoa, and the influence of various feeds on hatchability. In all, 18 different rations were compared.

Fertility did not appear to be significantly affected by the various feeds. It was observed, however, that in pens where the average production was highest during the hatching season the fertility rate was lowest. Observations during the hatching season showed that birds fed feterita and hegari, although producing the largest number of eggs, were not in good physical condition. Birds fed on yellow corn, wheat and oats were healthy and vigorous, and the birds receiving the yellow corn, while laying fewer eggs, produced more fertile eggs. Kafir supplemented with green feed proved to be equal to yellow corn supplemented with green feed in both egg production and effect on health of birds.

Results of these studies show that green supplements stimulate the birds, increase the egg production, and decrease the mortality. Kafir proved to be more efficient for egg production than darso, but both grains could be substituted for yellow corn if green feed or such feeds as carrots and alfalfa hay were fed once daily during the laying period.

All Mash or Mash and Grain Good. R. B. Thompson.

Over a period of three years, using five lots of 48 hens each year, there was no significant difference in the amount of feed consumed, number of eggs laid, size of eggs, or weight of hens in lots fed by the all-mash method and in lots receiving grain and mash. In two of the three years, the use of lights was not profitable.

High and Low Protein Rations Tested. L. Morris.

In this study 6 lots of 100 chicks each were handled in the same manner but during their first eleven weeks fed rations varying in protein content from 14·32 to 23·13 per cent. From 12 to 22 weeks the protein content of the ration varied from 13·04 to 22·24 per cent. The lots receiving the low protein rations

weighed less throughout the test than the other lots. There was little difference in the feed consumption of the various lots, but an excessive mortality was common to all lots.

Cottonseed Meal for Poultry. R. B. Thompson.

Summarising three years' results in this study (E. S. R., 57, p. 568), it is shown that cottonseed meal was a satisfactory protein for laying hens when supplemented with minerals and that it had no toxic effect on the hens. Cooking the meal under pressure did not change these properties so far as hens were concerned. Adding minerals to a mash containing cottonseed meal stimulated the feed consumption. Eggs of uniform high fertility were produced when the mash contained as high as 50 per cent. of cottonseed meal. More eggs by weight and count were produced by lots receiving cottonseed meal and minerals than by lots receiving no cottonseed meal. More than 3 per cent. of mineral mixture did not affect egg production or yolk colour when cottonseed meal made up one-third of the mash. When the components of the mineral mixture were fed separately, salt gave the best results, followed by bone meal, while calcium gave the poorest results. Using from 3 to 6 per cent. of hydrated lime in a mash containing 3 per cent.of mineral mixture increased egg production and decreased the intensity of the yolk colour, but without the mineral mixture had no effect. Excellent eggs for storage purposes were produced when the mash contained 7 per cent of cottonseed meal, but 33·33 per cent. of cottonseed meal produced an egg that developed an olive-green yolk during storage.

The olive yolk caused by cottonseed meal was free from bacteria, had no foreign flavour or odour, was wholesome, and changed to yellow when the egg was cooked or the yolk whipped. The H-ion concentration of the yolk is increased and that of the white decreased when cottonseed meal is fed in sufficient quantities to discolour the yolk. Hens receiving 33·33 per cent. of cottonseed meal had blood with a high uric acid content. The yolks of eggs produced when cottonseed meal was fed stood up well and were firm, but the albumin was often slightly pink in colour and not clear white. Olive yolks increased in size and weight during storage, apparently due to the absorption of water. The ammonia nitrogen and protein nitrogen of olive-yolked eggs were the same as in eggs produced when no cottonseed meal was fed.

Forcing Doesn't Injure Breeding Hens. R. B. Thompson and R. Penquite.

In a study with nine lots of 19 pullets each fed different rations of mash and grain, all mash, or all grain, it was found that moderate forcing for winter egg production did not affect the health of the hen, the body weight, size of egg, fertility or hatchability when the ration was complete and included a daily supply of green feed. Hens fed on an entire grain ration laid light-weight eggs and never developed to full adult size.

Profits Follow High Egg Production. R. B. Thompson.

Based on the results of seven egg-laying contests, it was observed that the greater the number of eggs produced the greater was the return above feed cost, the lower the cost of feed per dozen eggs, and the greater the amount of feed consumed. Culling during the winter months was found to be a doubtful practice, and better results were obtained by eliminating hens that stopped laying from June to October. Peak production was reached during the months of March and April.

Mystery Shows Egg Quality Betterment. R. B. Thompson.

Observations made during this incomplete study of poor egg quality and storage losses are noted in this article.

Fibre in Ration Tested. L. Morris.

In a test covering one year, an attempt was made to determine the maximum, minimum and optimum amounts of fibre for baby chicks, using six

lots of 100 chicks each. Rations were fed containing from 3·84 to 10·29 per cent. of fibre. No effect was noted on the growth or health of the chicks that could be attributed to the amount of fibre in the ration.

Profits Doubtful from Capons. R. Penquite.

Studies covering a period of three years to determine the cost of growing capons from fryer size to different ages showed that there was usually not enough spread between the prices of fryers and capons to make it profitable to raise the latter. The average profit on each lot would have been $10.69 if the birds had been sold as fryers, while the average profit for capons was $2.92. The average mortality of all pens was 18·6 per cent. and the average percentage of slips was 18·1. The cheapest gains were produced on a ration of equal parts of cubed yellow corn and kafir with buttermilk *ad libitum.*

Sorghum Smuts Prove Harmless.

The sorghum heads from a field in which 70 per cent of the heads were infected with a kernel smut were gathered, the number of damaged kernels determined, and the amount of smut estimated. The spores of the smut were fed in balanced rations to young and grown chicks without any apparent effect on the growth, egg production, or hatchability of the eggs.

Edible Fish-meal. Its Composition and Value with Instructions for its Use in Feeding Cattle, Swine, Sheep and Poultry. Rodney De Lisle. Fisheries Department, Province of British Columbia, Victoria, 1930.

Contents :

History. Composition. Value as Feeding Stuff. Part I, Dairy Cattle. Part II, Fish-meal in the Swine Ration. Part III, Poultry. Part IV, Sheep. Part V, The Horse.

Supplement A. Recent advances in Animal Nutrition. W. Godden.

Introduction.—This bulletin is issued by the Provincial Fisheries Department to meet the increasing demand for information as to the composition of edible fish-meal, now so extensivly produced in the Province, its value in the feeding of cattle, sheep, pigs, and poultry, and giving instructions for its use.

It gives a review of the researches, experiments, and results in many countries in the feeding of edible fish-meal to domestic live stock and poultry, and is written not only for the farmer who desires to improve his live stock through better feeding methods, but also for those engaged in the production of fish-meal.

The Provincial Fisheries Department, Victoria, will be pleased to reply to any specific questions that may arise as to the best use of edible fish-meal used in feeding.

Worms as Poultry Food. Würmer als Hühnerfutter. Geflügelwirtschaft, August 8, 1931.

Poultry are fond of worms, larvæ, grubs, beetles. It often happens that chickens become ill and die after eating too much of these. Even full grown poultry should not be given too much of this class of food. It is a general, but still unchallenged opinion, that rainworms are poisonous during the pairing season (May, June and July). The so-called manure-worms are often found on farms. These are ill smelling worms which give off a liquid which spoils the taste of the eggs.

Grasshoppers not such Good Chicken Feed After all. Poultry Tribune, November 1931.

"Although farmers in Wisconsin have found that chickens will clean up grasshoppers, it may not be such an economical practice to let them do it," says G. E. Annin of the Wisconsin College of Agriculture, "because recent studies made by Miss Eloise Cram, parasitologist for the United States Department of Agriculture, have shown that grasshoppers carry tape worms which attack chickens."

On the Ignatx Farm in Marathon County, 1,211 pullets were placed near a cornfield that the grasshoppers had attacked after working in the nearby alfalfa. Examinations at the end of the summer showed all these pullets to be heavily infested with these tape worms. Circumstantial evidence seems to show that the hoppers were to blame.

Feeding Chicks. Die Kükenaufzucht mit wirtschaftseigner Futtermischung. J. Schmidt and T. Zöllner. Tierernährung, 1931, No. 13.

Of one group consisting of about 110 one-day chickens the groups I and III were fed with a self mixed food for ten weeks and groups II and IV were fed with a mixture made by the Krusa-Werke in Cassel. The two mixtures varied as regards richness and price. Both consisted of grain and meal foods. The increase in weight with both foods was about the same. The consumption of food in the Krusa groups per bird and per kg. weight increase was somewhat smaller than in the other groups but the cost in the Krusa groups per bird was about 2-7 Pfg. and per kg. weight increase about 12-15 Pfg. higher. Mortality among the Krusa groups was 1 per cent. and 2 per cent. lower than in the control groups.

Milk in the Feeding of Poults. R. Learmouth. Rhode Island Agricultural Experiment Station, Kingston. Journal of the American Veterinary Medical Association, 1931, p. 206.

Summary.

1. The addition of 30 per cent. of dry skimmed milk in a representative mash mixture for chicks, fed to poults under ten weeks of age does not appear detrimental.
2. This same 30 per cent. increase growth and vitality.
3. Growing poults must have a diet as nourishing as the average dried mash.
4. The value of dry skimmed milk whether due to its protein, vitamin, mineral, or milk sugar content, has not been determined.
5. Young growing stocks requires protein. The greatest protein increase is due to animal protein as vegetable protein sources also furnish carbohydrate food not so necessary to growing stock. The vegetable protein and carbohydrate grains also are rich in vitamin B. Milk contains animal protein. Animal proteins (meat and fish-meal) contain no vitamin B.
6. It appears reasonable then to say that the value from dried skim milk was due more to the increase of protein than the increase of vitamin B. Therefore a mash mixture high in animal protein seems to be indicated for the feeding of growing poults.

Pellets for Poultry. The Yorkshire Post, January 14, 1932.

The use of artificial foodstuffs for all kinds of farm stock is now so common

that, in addition to the industry of making it, considerable employment is provided for engineers. Intricate machinery is required.

It is now some years ago that Messrs. Richard Sizer, Limited, of Hull, introduced their first cube machine known as the " Cuber," which was immediately recognised as a great advancement upon the old methods. Since this machine has been on the market, and incidentally sold to customers all over the world, Messrs. Sizer have put on the market many improvements to the original machine, and also improved apparatus for the same purpose.

For instance the " Cuber " has been superseded by the " Orbit " machine when output is the primary factor. The " Cuber " will produce about 25 cwt. of first-class cubes per hour with 12 B.H.P. or 800 lb. of pellets with 8 h.p. This in itself is unique as the machine can be changed from size to size or from cubes to pellets within the space of about ten minutes. The " Orbit," on the other hand, will produce up to six tons of cubes per hour with 15 h.p. and in this respect it is the finest proposition available.

Another machine of the Sizer range is the " Biorb " which embodies a combination of the most desirable features in the " Cuber " and " Orbit " for one particular purpose, namely, the manufacture of pellets in all sizes for feeding chicks, pullets, full-grown birds, turkeys, geese and rabbits. The power required is no more than 12½ B.H.P. and the output no less than 1,400 lbs. per hour. This, however, is more especially designed for the manufacture of pellets alone.

ANATOMY AND PHYSIOLOGY

Development of the Comb in Castrated Hens. Remarques relatives à la Croissance, selon le type male de la Crete de la Poule ovariectomisee. J. Benoit. Comptes rendus de la Societé de Biologie, Tome 108, 1931, p. 788.

After castration the comb begins to grow as a result of the development of the right gonade. The comb sometimes grows much quicker than is the case in a normal cock. Perhaps the right gonade shows strongly increased function similar to that which takes place in cocks which have been only partly castrated.

Development of the Comb in Castrated Hens. Evolution, chez la Poule ovariectomisee de la Crete ayant atteint son developpement male complet. J. Benoit. Comptes rendus de la Societé de Biologie, Tome 108, 1931, p. 791.

The comb of a castrated hen develops very quickly, sometimes quicker than that of a cock. The combs of cocks are largest in spring and shrink later. This is repeated every year but as the cock grows older the comb becomes smaller.

Besides the comb of a cock, the castrated hen also develops the feathers of a cock in the beginning. As a rule, however, hen feathers develop later. In this case a certain development of the oviduct will be found. This points to a female hormon which gradually increases. This causes the comb to shrink.

The Structural Basis for the Response of the Comb of the Brown Leghorn Fowl to the Sex Hormones. M. Hardesty. American Journal of Anatomy, 1931. (Ref. Züchtungskunde, November, 1931.

Up to the present investigations regarding the subordination of the formation of the comb in poultry have referred especially to the size and outer structure. The writer investigated the histological comparisons and found that in sexually ripe cocks and in sexually ripe hens the epidermis does not show any specialities as compared to their other formations. The corium is divided into a layer of marrow with connecting tissue fibres, blood vessels and fat ; an intermediate layer with hollow connecting tissues and an extensive mucin secretion ; a peripheric layer with compact connecting tissues and fine blood capillaries. In capons and non-laying hens the mucin disappears ; in early castrates it is not formed. The blood pressure is lowered in capons so that the capillaries grow smaller or disappear. After injection with one of the sex hormones secretion of mucin takes place and the blood pressure rises. Male and female hormones are only quantitatively distinguishable in their action. Remains of combs do not regenerate.

Experimental Hyperpituitarism in Hens. L'Hyperpituitarisme experimental chez la Poule. M. Renoult. Recueil de Médecine Vétérinaire de l'Ecole d'Alfort, Tome 107, 1931, p. 604.

In hens, repeated injections of extract of the front lobe of the hypophysis cause :—

A.—In growing birds (1) Retardation of the growth ; (2) Retardation of the period in which laying begins ; (3). Cessation of laying ; (4) Bad development of the oviduct and smaller eggs ; (5) Hindrance of the development of the secondary sexual features.

B.—In full grown birds (1) Cessation of laying ; (2) Paling of the organs rich in blood vessels, shrinking of the comb. All these symptoms are just contrary to those which occur in mammals.

The Influence of Castration on the Flesh Production of Rhode Island Reds. Der Einflusz der Kastration auf die Fleischproduktion der Rhode Island Red Rasse. Z. V. Csukars. Mezögazd. Kutat. IV, 1931. (Ref. Züchtungskunde, January, 1932.)

The best time for the operation is at the age of between eight to ten weeks with the weight at 3/4 to 1 kg. The number of blood corpuscles in cocks is calculated at 3·7 millions, in capons at 2·5 millions with a hæmoglobin content of 57·3 per cent. or 45 per cent. The albumen content in the breast-muscle flesh of the cock is higher than that of the capon, the content of fat is higher in the capon. The daily increase on 1,000 g. living weight in capons is 6·86 g. and in cocks 5·15 g. After seven months, thus at an age between nine to ten months, capons reach a weight which is somewhere about 35·3 per cent. higher than that of cocks of the same age. Capons double the weight from the same food.

Influence of Thallium Salts on the Moulting Mechanism of Fowls. W. Landauer. Journal of Agricultural Research, Vol. 43, 1931.

The feeding of thyroid-gland substance causes moulting in poultry and other birds and in many cases also causes changes in the pigmentation of the newly formed feathers. The writer asks whether this is a question of specific actions of the thyroid gland hormons and describes experiments with thallium salts. Thallium causes a falling out of hair in mammals. It was also observed that after being treated with thallium, sexually ripe cocks and chickens lost their feathers. The loss of feathers from the throat, breast, neck and head is larger than from other parts of the body. New feathers grow immediately on the places where the old ones have fallen out. The action of thallium seems to fail in female birds. The feathers formed in the thallium moulting period are normal both in colour and marking, but they frequently keep their feather sheath an abnormally long time. Thallium acetate appeared to be the most active. Young ckickens appear to have a greater power of resistance against thallium poisoning than older birds.

Cataract by Feeding Naphthalin. (Ref. Tijdschrift voor Diergeneeskunde, 1931, p. 951.)

In hens, to which naphthalin had been administered, a disturbance of the lens first occurred which later developed into a real cataract. It was noted with interest that when these hens were paired with healthy cocks this cataract appeared in the third and fourth generation. It was further noted than when a little naphthalin was injected into eggs in hatching it frequently happened that chickens were born with cataracts or other eye anomalies.

Artificial Growth of the Organs of Chicken Embryos. Production in vitro d'un Epithelium aux depens des Fibroblastes du cœur d'Embryon de Poule. H. Grossfeld. Comptes rendus des Séances de la Société de Biologie, Tome 108, 1931, p. 747.

The writer has artificially cultivated various organs of chickens in tubes, namely: parts of the iris, the stomach, the liver, the kidneys and the heart. The method is described. The cultures of stomach, iris, liver and kidneys only showed growth of epithelium cells. Fibroblasts and epithelium cells developed in the cultures of the heart. Epithelium cells could develop from the fibroblasts.

Hæmopoiesis in the Liver and the Bone-Marrow of the Carrier-Pigeon Following Splenectomy. Yoshiyuki Toryu. From the Morioka Imperial College of Agriculture and Forestry, Morioka. Journal of the Japanese Society of Veterinary Science, 1931, p. 389.

In the present investigation I have dealt with the hæmopoiesis in the liver and the bone-marrow of the carrier-pigeon following the total splenectomy, with the hope of obtaining further data concerning the function of the spleen.

Eight healthy adults of about 24 months were splenectomised and the bone-marrow and the liver were histologically examined. No case of the formation of a new spleen was seen in eight splenectomised animals kept from 15 to 210 days after the operation.

The results obtained in this investigation may be summarised as follows:

1. The bone-marrow of the femur and the tibia, after the removal of the whole spleen, becomes fatty and inactive in the erythrocyte formation.

2. On the contrary, however, the lymphocyte formation is more active in the splenectomised pigeon than in the controls.

3. After the total splenectomy new red cells are formed in the liver; hæmopoietic tissue occurs in the hepatic lobules. Various stages in the formation of erythrocytes are seen in the central veins and the capillaries of acini.

4. Splenectomy in the adult carrier-pigeon causes an appearance of the polychromatophiles in the general circulation in from about 3 to 8 per cent. of the total red cells. These cells seem to be associated with the hæmopoiesis occurred in the liver.

4. The hæmoglobin content after the splenectomy does not reach the normal level, probably owing to the appearance of the polychromatophiles mentioned above.

Studies on the Physiology of Reproduction in Birds.—XXVII, The age distribution of mortality in bird embryos and its probable significance. O. Riddle. American Journal of Physiology, 94 (1930), No. 3, pp. 535-547, fig. 1. (Ref. Experiment Station Record 1931, pp. 770.

In continuing this series (E. S. R., 62, p. 825), data are reported on the embryonic mortality in ring doves, wild doves, and common pigeons. In conformity with the findings of L. F. Payne, there were found two stages of heavy mortality in fowls. One was early in the incubation period at about the third or fourth day, and the other occurred during the final two or three days of incubation. The mortality early in incubation appears to be related to failure in the respiratory adjustment, while the heavy mortality just before hatching appears to be associated with a deficient water supply.

The Relation of Gonadal Condition to Erythocyte Number in Fowls. M. Juhn and L. V. Domm. American Journal of Physiology, 94 (1930), No. 3, pp. 656-661, fig. 1.

Erythrocyte counts were made at intervals from hatching to 16 months of age on 40 males and 40 females, and it was found that males showed higher counts than females at maturity. Gonadectomised and young birds showed counts similar to females. When the functional ovary was removed from females and the other ovary permitted to hypertrophy into the testis-like organ, the erythrocyte count closely approximated that of the male.

The Male Hormone. C. Funk, B. Harrow, and A. Lejwa. American Journal of Physiology, 92, 1930, No. 2, pp. 440-499, fig. 1. (Ref. Experiment Station Record, 1931, p. 769.)

A study of the urine of young men showed that alcohol extracts from fatty acid fractions contained a hormone which induced comb growth in capons upon injection after the comb and wattles had retrogressed and ceased to change as a result of castration. Extracts of pig testicles produced similar although less marked effects. Administration of the male hormone from this source, per os, produced some results, but the effect was less pronounced and less constant. A notation indicates that the hormone could be extracted to best advantage from urine made strongly acid by hydrochloric acid, and that impurities might be removed by a double precipitation with ether. The final product could be sterilised without injury to its activity.

Thyrogenous Dwarfism (Myxoedema Infantilis) in the domestic Fowl. W. Landauer, American Journal of Anatomy, 43, 1929, No. 1, pp. 1-43, figs. 19.

A careful description is given of the anatomy of a thyrogenous dwarf Rhode Island Red pullet observed at the Connecticut Storrs Experiment Station, together with comparative measurements of the skeletons of five similar birds observed at the Kansas Experiment Station.

Transplantation of Young Ovaries in old Hens. Transplantation junger Keimdrüsen bei alten Hennen und ihre Wirkung auf die Legeleistung. Dr. J. Kohan. Institut für experimentelle Biologie, Moscau. Archiv für Geflügelkunde, Tome 2, p. 21.

The ovaries of young hens were transplanted on to 59 old hens which had finished laying. All these old hens began to lay again.

Influence of Ultra-Violet Rays. C. Sheard, G. M. Higgins, W. Foster. American Journal of Physiology, 1930, p. 84.

The growth of chickens which were only subjected to short wave rays was not so good as that of the control chickens. This was also the case with chickens which were only treated with long wave rays.

It was sufficient to subject only the heads of the chickens to the treatment. The rays with a wave length of 270-400 micron did not contain some of the useful rays of other wave lengths. In the absence of these rays hyperplasia of the parathyroid glands occurs and the improvement of the bones is not normal.

From this it appears that the visible portion of the spectrum plays just as great a part in the development of the chicken as the invisible rays.

DISEASES

INFECTIOUS DISEASES

PULLORUM

Invitation to a Pullorum Conference in Hannover and the World's Poultry Congress in Rome. By Dr. te Hennepe. Sixth Congress of Specialists in Combatting Young Animal Diseases. Deutsche Tierärtzliche Wochenschrift, 1931, p. 661.

A congress of veterinary surgeons interested in the combatting of young animal diseases was held at Leipzig from October 3 to 6, 1931 ; 140 veterinary surgeons attended. Pullorum disease was discussed.

An interesting speech, held by Dr. te Hennepe, of Rotterdam, in which a spice of humour was not lacking, was well received by the conference. Dr. te Hennepe referred to the unity in all branches of science and discussed in detail poultry diseases. He informed the meeting that an international conference for a further discussion of pullorum disease would be held at Hannover on October 23, 24 and 25. He invited those present to take part in this conference.

He also referred to the World Poultry Congress that will take place in Rome in 1933. The congress will be held in the Forum Trajanum where, after 2,000 years, the cocks will crow again.

Conference of Veterinary Surgeons, Leipzig, October 3 to 6, 1931. Deutsche Tierärzliche Wochenschrift, 1931, p. 661.

Prof. D. Eber spoke about Pullorum and the Trade in Eggs for Hatching and Day-Old Chicks.

Speaker was of opinion that strict control would lead to good results in the combatting of pullorum. Breeders should combine and establish breeding societies, which societies should be subject to regular control by recognised institutes. Under present conditions, the danger of infection from a single infected hatching egg and chicken is often exaggerated. The apparent circumstances, for which the supplier cannot be made responsible, should, in general, be more strictly investigated.

Dr. te Hennepe (Rotterdam) announced that an **International Pullorum Conference would be held at Hannover, to which he invited all those present.**

Dr. Joh. Schmidt spoke about Iodine and Poultry.

Conclusions.

1. The significance of iodine for poultry has not yet been sufficiently explained.
2. The resistance of poultry to large doses of iodine is great.
3. The feeding of iodine results in the laying of eggs containing iodine. The laying of such eggs continues for some time after the feeding of iodine is stopped. Such eggs can be stored for exceptionally long periods.

Resolution of the Conference.

The combatting of pullorum has made such progress that, with the help of the blood test and the isolation of reactors, the spreading of the disease can be kept well in hand. The meeting were agreed that negotiations should be opened as quickly as possible with the organisations concerned, regarding sales conditions for eggs for hatching and day-old chicks. They are of opinion, that with the innovation of comprehensive and measures necessary for the combatting of pullorum, breeders, who subject themselves to the conditions of the control, will be freed from the responsibility.

Progress of International Pullorum Conference at Hannover, October 23-24, 1931.

This conference was organised by Dr. te Hennepe, Secretary for Continental Europe, of the W.P.S.A., in the Institute of Professor Mieszner, at Hannover.

Friday, October 23, 5 p.m.—Testing of the serum of 30 hens according to the old, slow method. Every scientist brings with him a small quantity of the serum used by him, so that all these antigens can be compared.

Saturday, 10 a.m.—

1. Examination of the blood of the hens with the blood drop-rapid-test and the blood-smear-rapid test.
2. Comparison of the results with the serum-slow-test.
3. Preparation of the antigen : (*a*) growing media ; (*b*) dilution liquid ; (*c*) concentration.
4. Examination of the slaughtered hens.
5. Visit to the Institute of Hygiene and the Museum of Prof. Mieszner.

2 a.m.—Visit to the Hannover Poultry Exhibition. The President of the Hannover Poultry Association, Mr. O. Sievers has kindly supplied free tickets of admission.

7 a.m.—General meeting with Authorities of the University of Hannover and the members of the Council of Poultry Associations in Germany.

All discussions can take place in the English, French or German languages.

A Stained Antigen for the Rapid whole Blood Test for Pullorum Disease. J. M. Schaffer, A. W. McDonald, W. J. Hall and H. Bunyea. Journal of the American Veterinary Medical Association, 1931, p. 236.

Summary.

A new antigen has been developed for use in the rapid whole blood agglutination test for pullorum disease. It is sterile, has good keeping quality, and the bacteria are stained a deep violet.

Reactions are easily distinguishable against a white background.

The antigen consists of a suspension of Salmonella pullorum in 0·85 per cent. sodium chloride solution, adjusted to a turbidity 75 times that of Standard No. 1 of the McFarland scale, killed and preserved by the addition of 1 per cent. liquor formaldehyde and stained by the addition of 0·05 per cent. crystal violet.

The test may be made by mixing one drop of the antigen with a rather heavy blood smear on a glass plate.

A more precise method is to measure 0·02 c.c. of blood in a wire loop and mix this on a glass plate with 0·05 c.c. of the antigen.

The stained antigen for the rapid whole blood agglutination test for pullorum disease deserves extended field trial.

Rapid Blood Agglutination Test. S. Plasaj and T. Tomasec. Jugoslovenski Veterinarski Glasnik, 1931, p. 70. (Ref. Winer Tierärztliche Monatschrift, 1931, p. 530.)

For comparison with the slow method three rapid method tests were made, namely, serum-rapid-test, blood-drop-rapid-test and blood-smear-rapid-test.

331 hens were subjected to the serum-rapid-test of which 328 (99·1 per cent.) reacted in the same manner as with the serum-slow-test and only three (0·9 per cent.) showed deviating results.

142 hens were subjected to the blood-drop-rapid-test. In 120 cases (84·5 per cent.) similar results were obtained and 22 cases (15·5 per cent.) deviated.

140 hens were subjected to the rapid-blood-smear-test of which 132 (94·3 per cent.) showed similar results. In only 8 (5·7 per cent.) were the results negative and according to the serum-slow-test positive. Blood of which the serum-titre was more than 1 : 40 gave positive reaction with this method.

Agglutination Test. Dr. Hugo Rautmann. Bericht über die Tätigkeit des Bakteriologischen Instituts der Landwirtschaftskammer für die Prov. Sachsen zu Halle A.S. 1930, p. 44.

In a flock 93 birds reacted positively with a titre of 1 : 50. After 35 days only 55 hens (59 per cent.) reacted positively with the same titre. Of the 35 positive reacting hens in a second flock only 25 (71·5 per cent.) reacted positively after eight days and in a third flock of the 26 positive reactors only 21 (80 per cent.) reacted positively after 51 days.

In a second test a total of only 65·5 per cent. of the positive reacting birds were found to be positive again.

This must be attributed to change in the agglutinin content in the blood and incompleteness of the method of investigation.

The mistakes which can occur in blood agglutination are clear from the results obtained in the 93 birds mentioned in the first case. The tests were carried out simultaneously at four different institutions. With a titre of 1 : 50 institute A found 59 per cent. of the 93 hens positive and institute B, only 29 per cent. With a titre of 1 : 100 the figures were A 40 per cent., C 22·5 per cent. and D 4·3 per cent. These results are extremely unfavourable. In total there were only 50 per cent. similar and 50 per cent. dissimilar results obtained. The serum-slow-test is not yet trustworthy and the blood-drop-rapid-tests shows still greater deviations.

Eliminating Pullorum Disease. Canadian Poultry Journal, August, 1931.

Following the lead which has been given by the Poultry Division of the Dominion Experimental Farms, the Department of Agriculture for New Brunswick in its annual report just issued has this reference : " The Poultry Division has again conducted a campaign for the blood testing of poultry to eliminate carriers of pullorum disease. More than 21,500 birds have been tested (1930) as compared with 16,000 in 1929. The percentage of birds reacting was 8·8 as compared with 9·5 last year. Since testing was begun in 1928 there has been a marked improvement in the livability of chicks."

Eradication of Pullorum Disease. Dr. E. H. Jenkins. Storrs Agricultural Experiment Station, Bulletin 168.

The eradication campaign was begun in 1914, the object being to cull

out from flocks every infected hen. At present there are in the state over 100 flocks, numbering 75,000 birds, that are " accredited " ; that is, they have had no case of the disease in two years ; and there are perhaps 100 other flocks which are " free " as shown in a single test of each hen in the flock. The work of eradication is being carried on vigorously and the poultry business is becoming more popular and profitable than ever.

A Field Test for Pullorum Disease. D. R. Coburn, Michigan Bureau of Animal Industry and H. J. Stafseth, Michigan State College, East Lansing. Journal of the American Veterinary Medical Association, 1931, p. 241.

Summary.

The use of a rapid agglutination test employing whole blood is practical as a field test for pullorum disease.

Three improvements in the technique of the rapid test are here reported :

1. A highly stained (gentian violet) antigen.
2. A white porcelain plate for a contrasting background, thereby eliminating the necessity of artificial lighting.
3. Standardised pipettes for delivering accurate quantities of blood and antigen.

The Viability of the B. Pullorum in the Tissues of the Dead Chick. Report of the Ontario Veterinary College, 1928. Toronto, Ontario, 1929, p. 32.

B. pullorum has marked powers of resistance against putrefactive changes. There is also some evidence of a multiplication of the organism during the first few days. These facts have a practical value. It means that dead chicks can be shipped to the laboratory from distant points in the Province with the reasonable assurance of a satisfactory diagnosis.

Pullorum Disease. A Broerman. Ohio Agricultural Experiment Station. The Bi-monthly Bulletin, Wooster, Ohio. 1931, No. 150.

Description of the disease in chicks. Symptoms in chicks. Post-mortem Findings. Diagnosis. Treatment and Control. The Disease in Adult Fowls. Symptoms and Lesions. Diagnosis. Prevention. The Agglutination Test.

Re-tests of infected flocks are to be made each month or six weeks until no reactors are found. This method of testing is considered to be a more economical and successful means of eradicating this disease than a single annual test.

Mortality in Chicks. Litt om hyllingdo deligheit. A. J. Brandt. Veterinärinstitut, Oslo. (Ref. Deutsche Tierärztlich Wochenschrift, 1931, p. 442.)

The symptoms of infection with pullorum bacilli among chickens and adult hens is described. A 24-hours' old culture in ½ per cent. dextrose-neutral-broth is most suitable as antigen for the blood agglutination test.

Various cases of chicken disease are discussed.

Egg-Laying of Reactor Hens. Arbeiten auf dem Gebiete der Kückenruhrinfektion. Uber die Leistungen pullorum-positiver Hennen. Dr. W. Kiessig. Kiel. Deutsche Tierärztliche Wochenschrift, 1931, p. 593.

Positive reactors laid fewer eggs than negative reactors. The hatching results of positive reacting hens were 44·9 per cent. and of negative 57·0 per cent. Mortality among chickens from positive hens was not abnormal as regards pullorum disease.

Mortality in connection with coccidiosis infection was, however, considerably higher.

The total deaths among chickens from positive hens amounted up to four months old to 30 per cent. and from negative hens 10·4 per cent.

The reaction percentages of chickens of the positive groups were 56·4 per cent., 45·4 per cent., 35·7 per cent., and of chickens of the negative groups, 7·4 per cent. and 7·9 per cent.

Pullorum Disease in Hens. Die Pullorum infektion der Hühner. R. Berge, Mieszner-Festschrift, 1931. Editor : Schaper, Hannover.

The typical changes in chickens are described. Adult hens can suffer from the acute (septi-chæmic) and chronic forms. B. pullorum is identical with the cause of Klein's Disease and of Fowl Typhoid (Pfeiler and Rehse).

The percentage of hatching eggs from positive reactors infected with B. pullorum was 15·4 per cent. The cultivation of pullorum bacilli from fresh eggs was not successful. No success attended experiments to transmit the disease from positive reactors to negative reactors by keeping them together in one pen. The serum slow test has proved to be trustworthy with a titre of 1 : 100.

After a third examination no more positive reactors were found in a flock of 400 young hens.

Pullorum in Italy. Br. Ubertini. La Clinica veterinaria, 1931, p. 4.

Pullorum disease is met with in all parts of the province of Brescia. It is not known when the disease first made its appearance there. Three localities of infection are described. Mortality varied between 70 per cent. to 100 per cent.

Avoidance of Danger of Pullorum Disease by Importation.

Since January, 1931, the Swiss Government has forbidden the import of chickens still covered with down. Only chickens of four or five weeks of age may be imported.

Pullorum Disease and Typhoid. V. Liebling. Jugoslovenski Veterinarski Glasnik, 1931, p. 50. (Ref. Wiener Tierärztliche Monatschrift, 1931, p. 530.)

Summary compiled from the results of various congresses and literature. Description of the rapid blood test.

A Comparative Study of the Intradermal Tests and the Agglutination Method with and without Modifications for White Diarrhœa. Storrs Agricultural Experimental Station, Bulletin 162.

Two separate experiments (one begun in 1927) were conducted, about 90 adult chickens of known history (both positive and negative) being used in the first and about 70 in the second. Several agglutination and two intradermal (wattle) tests were conducted on each bird. Two different commercial brands of Pullorin were employed.

In both experiments the agglutination tests run on the same individual birds at different times were in close agreement with each other and with the post-mortem observations. The results obtained with the wattle tests were quite irregular and unsatisfactory.

The Transmission of Pullorum Disease (Bacillary White Diarrhœa) among Adult Stock. G. H. Warrack and T. Dalling. Veterinary Journal, 87, 1931, No. 667, pp. 24-27.

Experiments are reported which indicate that the transmission of pullorum disease takes place in adult stock between reactors and nonreactors. It appears that the smaller the space in which the fowls are penned the greater is the chance of such transmission taking place.

A Modification of the Rapid Agglutination Reaction. W. J. B. Green and E. M. Robinson. South African Journal of Science, 27, 1930, pp. 487, 488.

The authors report that the agglutination test of Bunyea, Hall, and Dorset for pullorum infection has proved very satisfactory in South Africa. They have found that a slide smear made from an infected fowl will give a reaction even after a month has elapsed.

The Reaction of the Fowl to Pullorin. L. D. Bushnell and C. A. Brandly. Journal of the American Veterinary Medical Association, 78, 1931, No. 1, pp. 64-78, figs. 2.

This is a report of work conducted at the Kansas Experiment Station the details of which are given in tabular and chart form.

" The very thin skin of the wattle of the fowl precludes the possibility of intradermal injection in many cases with the methods generally employed. The reaction to a single ' intradermal ' injection of digest pullorin is manifested by a non-specific early swelling in infected as well as non-infected fowl, which reaches its maximum size at three to four hours following injection, and a later specific reaction which attains its maximum size at an average time of 22·5 hours. The character of soft œdema with more or less severe swelling as detected by the touch is a more satisfactory criterion for interpretation of the reaction to pullorin than the increase in the thickness of the wattle as measured with the micrometer.

" Macroscopically and microscopically the pullorin reaction resembles the tuberculin reaction as manifested in birds and other species. Frequent repeated tests with digest pullorins do not cause significant desensitisation of reactive individuals. The ecto and digest pullorins used in these studies were more satisfactory than other types prepared in our laboratory or those obtained from other sources. In an effort to develop a satisfactory pullorin, sources of variation in the test, including methods of application and standards of interpretation and comparison must be given major consideration."

The Effect of Temperature upon the Production of Hydrogen Sulphide by Salmonella Pullorum. R. P. Tittsler. Journal of Bacteriology, 21, 1931, No, 2, pp. 111-118.

In studies conducted at the Pennsylvania Experiment Station, the details of which are here presented in tabular form, an incubation temperature of 30° C. was found to be the optimum for hydrogen sulfide production by *S. pullorum.* Temperatures above 37° were found to inhibit hydrogen sulfide production. " Slight quantitative differences between ærogenic strains were noted at 30°. The ability to produce hydrogen sulfide was a consistent characteristic. Strains which produced little hydrogen sulfide also produced small amounts of gas from carbohydrates. Strains which produced no hydrogen sulfide did not produce gas from any carbohydrates. The possibility of a new species is postulated. Difco lead acetate agar is a satisfactory medium with which to show hydrogen sulfide production."

TUBERCULOSIS

Avian Tubercle Bacilli in Milk and Bronchial Mucus of Cows. Ueber das Kulturverfahren zum Nachweis von Tuberkelbakterien, besonders in Gesamtmilchproben. K. L. Wolters and H. Dehmel. Zeitschrift für Infektions, Kranhheiten der Haustiere, Vol. 39, 1931, p. 107.

By the investigation of a new method for the cultivation of tubercle bacilli the writers found avian tubercle bacilli in 10 samples of ordinary trade milk. Until this occasion, the presence of avian tubercle bacilli in cows' milk was unknown. Further investigation must be made as to whether the cultivated bacilli of the cow are saprophites or whether they can cause tuberculosis of the udder.

In four cases avian tubercle bacilli were cultivated from the bronchial mucus of various cows. From this it appears that avian tubercle bacilli occur more frequently in cattle than one would assume from literature on this subject. This is of great importance with a view to the combatting of tuberculosis.

Experiments with Tuberculosis. Infection of Eggs. Untersuchungen über die Tuberkulose des Geflügels mit besonderer Berüscksichtigung der Ei-Infektion und der Empfanglichkeit des Hühner für die drei Tuberberkel barillen typen. H. Rautmann und A. Spiegl. Bakteriologisches Institut der Landwirtsschafts-Kammer für die Provinz Sachsen. Zeitschrift für Infektionskrankheiten, Tome 40, 1931, p. 64.

Summary.

Eggs were injected with three kinds of tubercle bacilli : hominis, bovis, avium.

The group treated with human tubercle bacilli showed the best hatching results (51 per cent.). After being injected into the albumen of the egg, the tubercle bacilli penetrate into the yolk and finally enter the organs of the chicken. Here they continue to live and can sometimes still be found in the organs of the chicken two months after hatching.

Human tubercle bacilli can remain alive in the body of the hen for eight and a half months without causing any visible processes.

Sometimes typical changes take place in a few organs without there being any inclination on the part of the process to spread.

The hen possesses in a high degree a natural immunity against infection with human and bovine tubercle bacilli. These bacilli are usually killed in the body of the hen.

If typical changes occur, then these show an inclination to cure.

The Granules of Avian Tubercle Virus. J. C. H. Broek. Thesis. Utrecht. June 22, 1931.

Much has already been written regarding the significance of the light-breaking granules, which have been observed both in and apart from tubercle bacilli. In this paper, investigations are referred to concerning the so-called free granules of avain tubercle bacilli. By intravenous culture, injections into rabbits numerous granules were observed in the spleen after 10 minutes, but on the contrary only few bacilli. From the third to the eighth day the number of bacilli increased while the granules were not so plentiful. A considerable decrease of the bacilliary forms was observed from the eighth day. This would signify a confirmation of the hypothese, that in animal organism the bacilli, under the influence of the defensive factors, are changed into granules, while later the tubercle bacilli are formed from these. The results in the lungs did not agree with this seeing that these organs contained numerous bacilli from the beginning of the experiment.

The investigations carried out with the aid of Schouten's micro-manipulator, form by far the most important part of this paper. With the help of this instrument, it is possible to isolate one tubercle bacil, or even a portion, and to introduce this into various foods. It was possible to obtain a rich culture by the injection of one bacil, which was again cultivated with success on to other feeding media. Granules were regularly observed in these passage cultures.

A culture of tubercle bacilli was obtained by sowing out the granules obtained from young avian tubercle bacilli cultures. This proved that the granules can develop into tubercle bacilli. It was not possible, however, to obtain daughter cultures by the injection of this culture.

With the help of the micro-manipulator tubercle bacilli were cut into two or three pieces, each of which contained one granule. It was not possible, however, to obtain a culture with these portions of bacilli.

Better results were obtained by growing granules, isolated from the exudate in the abdominal cavity of rabbits, by which the same culture was interperitonially injected after previous intravenous infection with avian tubercle bacilli. A culture of alcohol-acid resisting tubercle bacilli developed from these granules.

It was therefore possible to change *in vitro* the tubercle bacilli into granules and *vice versa*. Attempts were now made to create this symptom *in vivo*. Positive results were obtained with a guinea-pig. It received an injection in the right cervical lymph-gland of ten granules from a three months old culture of avian tubercle bacilli. After about three months the guinea-pig was killed ; both bacilli and granules were found in the various organs.

Bovine and Avian Tuberculosis. Zur Verwendbarkeit von Flockungsreaktionen bei der Diagnose der Rinder und Geflügeltuberculose. M. Müller. Tierärztliche Rundschau, Tome 40, p. 705.

In spite of the many methods the diagnosis of tuberculosis is still unsatisfactory ; some are not entirely reliable, some too lengthy, others too tiring and expensive. Further, the reactions give no clue in accordance with the strength of their attack for judging the character and extent of the changes. These drawbacks led the writer to subject the most recent floccilation reactions of Matefy

and Daranyi to a test, as these experiments are very simple and show the stage of the disease. The new methods are based on the standpoint that in the organism of tuberculosis patients there is an increase in the content of globulin in the blood serum as compared with the amount of albumen. This results in a disturbance of the stability of the serum colloid ; by the use of aluminium sulphate or alcohol, floccilation is easier caused than in the serum of non-infected animals. The globuline content of the blood increases and the stability of the serum decreases according to the extent of the changes in the organs. The closing sentence of the writer in his description of these methods is also not very promising. He says : " Neither the Matesy reaction with aluminium sulphate nor the Daranyi reaction with alcohol are suitable for detecting tuberculosis in living cattle and poultry as on one hand in about one-fifth of the cases they failed to discover the disease and on the other hand, in none tuberculosis animals, *viz.*, parasitical diseases of cattle, they showed a positive reaction in 1/3 to 3/4 of the cases.

Some Remarks on Avian Tuberculosis and its Diagnosis by Means of the Intradermal Tuberculine Test. J. E. Wilson. Veterinary Record, 1931, p. 406.

Sick birds excrete many tubercle bacilli. Author advises the killing of all emaciated birds in flocks which are infected. The remainder should be subjected to the intradermal test, the technique of which is described. All reactors should be killed.

Intradermal Tuberculin Test. S. Hirschenstein. Közlemények az összehasonlito élét es Kortan Kore'Col. Budapest, Tome 24, p. 437. (Ref. Wiener Tierärztliche Monatschrift, 1931, p. 529.)

The tuberculine, injected according to the method of van Es, causes a non-specific swelling in non-tuberculose hens.

University of Cambridge Institute of Animal Pathology: First Report, 1929-30. Cambridge: W. Heffer and Sons, Ltd.

An article on tuberculosis deals with the identification of the type of organism found in swine. Of 95 cases, 63 were due to the bovine type, 29 to the avian, one to the human, and two were due to mixed bovine and avian types. This work brings the English statistics of cases examined to 258 of which 65 per cent. were due to the bovine type and 27 per cent. to the avian type of bacillus. The bovine type of infection is contracted by swine from tuberculous cattle either by consuming raw contaminated by-products of the dairy, by running on pastures that have been grazed by cattle, or by yarding with cattle. The precautions that should be taken to protect swine are, therefore, obvious. The avian type is contracted from poultry and, to quote the Report, " pigs and poultry should not be allowed to run together over the same ground."

Avian Tuberculosis Tests in Denmark. Journal of the Department of Agriculture, Dublin, 1931, Vol. 30, No. 2.

Under the provisions of the Avian Tuberculosis Control Act, passed on March 31, 1930, a maximum sum of 20,000 Kr., or rather more than £1,100, is placed annually at the disposal of the Danish Ministry of Agriculture, for the purpose of grants in aid of tuberculin tests carried out as a diagnostic control measure against avian tuberculosis. The grants may be made only in

the case of poultry-keepers who are prepared either to kill off tuberculous birds or to isolate them in a manner approved by the Ministry, not only from the healthy fowl, but also from cattle and pigs, if such animals are kept. For the present, at least, only adult birds will be subjected to the test.

In making grants, preference will be given to flock owners who : (*a*) keep recognised breeding-centres ; (*b*) supply certain recognised poultry abattoirs ; (*c*) are suppliers of such pig abattoirs as have taken steps to stamp out tuberculosis, or (*d*) own herds of cattle which are either free from tuberculosis, or carry out State-aided tuberculin tests under the terms of the Law of February 5, 1904.

Applications for tuberculin tests of poultry must state the nature and number of the fowls kept, their general condition of health, and the name and address of the veterinary surgeon who is to carry out the test. The applicant must also sign a declaration stating his willingness to kill off any birds which may react, or to isolate them from the rest of the flock.

Avian Tuberculosis in U.S.A. Report of the Special Committee on Tuberculosis. Journal of the American Veterinary Medical Association, Vol. 79, 1931, p. 526.

From 8 to 24 per cent. of all adult chickens slaughtered at some of the poultry packing establishments are infected with tuberculosis. The seventh Annual Mid-Western States Tuberculosis Conference convened June 12, of this year. Its discussions were practically confined to the avian tuberculosis problem. The plan for the eradication is incorporated in full as a part of the report.

Cutaneous and Subcutaneous Tuberculosis in a Turkey. L. H. Scrivner and C. Elder. University of Wyoming, Laramie, Journal of American Veterinary Medical Association, 1931, p. 244.

No cases of cutaneous tuberculosis in turkeys appear to have been reported. Its occurrence is undoubtedly rare, although several cases have been reported in chickens, pigeons and parrots. Authors describe a case of generalised tuberculosis in a turkey which was characterised by large numbers of cutaneous lesions. The carcass appeared to be that of a turkey in fair condition. There were approximately 40 or 50 small hard nodules on the skin, varying in size from one to ten millimeters in diameter. The bacilli found in the nodules were of the avian type.

DIPHTHERIA

Treatment of Roup. Die Vorbeuge und Behandlung von Schnupfen und Diphtherie. Dr. Peymann, Wittenberg. Deutsche Land Wirtschaftliche Geflügelzeitung, November 5, 1931.

The writer advises chinosol, kalium permanganate, mianettes and sulpholiquid D.S. to be added to the drinking water every two days.

The nostrils should be syringed with a solution of 1 : 100 chinosol. The eyes should also be treated with chinosol water.

Preliminary Tests of Vaccination against Fowl Pox. H. R. Seddon and J. K. Hutchison. Glenfield Veterinary Research Station. Poultry, October 3, 1931.

Summary of the Work.

In summary, therefore, we feel that the results, taken broadly, have been highly satisfactory indeed, both from the point of view of protection of the bird against fowl pox and from increased egg-production, and it is intended, therefore, to extend the use of vaccine during the coming season. It is very important, however, that not only success but apparent failures be brought to our notice, as with further investigation it is confidently hoped that more satisfactory results may be attained. It must be remembered, however, that even in other diseases where vaccines have been used with marked success for many years unaccountable " breaks " sometimes occur.

Note.—Poultry farmers desirous of availing themselves of this vaccine are advised :—

1. That vaccinations must be completed before December 31, 1931.
2. That birds should be between 10 and 16 weeks of age, and it follows, therefore, that it may be necessary to undertake the vaccination of a complete flock in two or even three sections.
3. That in order that the value of vaccination may be accurately estimated, it is desired that not more than half the birds on the property be so treated. Vaccinated and non-vaccinated birds must not run together until at least six weeks after vaccination. If they can be kept separate during the fowl pox season, such would be an advantage, as the influence of vaccination on egg-production during this period can then be ascertained.

Early application, addressed to the Chief Veterinary Surgeon, Department of Agriculture, Sydney, is, therefore, desirable and applicants should furnish the following information :—

(*a*) Total number of pullets and cockerels on property.
(*b*) Number it is desired to have vaccinated.
(*c*) Ages, on September 30, and number of each age group, of the birds it is desired to have vaccinated.

Fowl Pox. Feathered World, February 26, 1932.

In view of the prevalence of fowl pox (avian diphtheria, diphtheritic roup, canker), the Ministry of Agriculture issues a timely reminder to poultry farmers that a vaccine against this disease is supplied by the Ministry's laboratory at the rate of 1d. per dose to cover the cost of production. This vaccine has been extensively tested in the field for over two years as a preventive of fowl pox, and over a million birds have been inoculated, with very satisfactory results. It confers a solid immunity of at least four months' duration—in most cases much longer—and is free from danger, causes no constitutional disturbance, and does not interfere with egg-production. There is a minimum charge of 2s. 6d., which covers a supply, post free, of 30 doses of the vaccine, with an instrument and brush for its application. In order to keep down the cost of production of the vaccine and to avoid unnecessary clerical work, cash must be enclosed with each order, which should be addressed to the Director, Ministry of Agriculture and Fisheries, Veterinary Laboratory, New Haw, Weybridge, Surrey. Cheques, money and postal orders should be made payable to " The Ministry of Agriculture and Fisheries," and crossed " Bank of England."

As regards the disease itself, a leaflet, No. 138, has been prepared by the Ministry, giving full details, and single copies of it can be obtained free of charge and post free on application to the Ministry of Agriculture, 10, Whitehall Place, London, S.W.1.

Vaccination against Fowl Pox. H. R. Seddon and J. K. Hutchinson. The Australasian Poultry World, December 1, 1932.

Following some preliminary trials at the Glenfield Veterinary Research Station, a vaccine which it was thought would be satisfactory was evolved. This vaccine has now been subjected to field trials for two seasons, and the purpose of this review is to give in summary the result of these trials.

During the season 1929-30, a total of 5,127 fowls were vaccinated, 5,440 birds running on the same properties being observed as controls. Only 0·31 per cent. of the vaccinated birds developed fowl pox, whereas 0·49 per cent. of the controls contracted the disease.

During the succeeding season, 1930-31, the field tests were extended and a total of 13,005 birds were vaccinated. With those were run 5,605 non-vaccinated controls. Result as follows :—

Cases of fowl pox : Vaccinated pullets, 0·6 per cent., non-vaccinated pullets 67·1 per cent.

Transmission of Fowl Pox by Mosquitoes. Preliminary Report. R. Matheson, E. L. Brunett, A. L. Brody. Poultry Science, 1931, p. 211.

Summary.

1. Nine positive transmissions of fowl pox by mosquitoes (Aedes vexans meigen) are recorded.

2. In three of these experiments the presence of Bollinger bodies were demonstrated in the enlarged cells of the lesions.

3. In six experiments fowl pox was transmitted 2, 3, 9, 16, 17 and 27 days after the mosquitoes had fed on fowl pox comb lesions.

4. In two experiments transmission occurred three and nine days after feeding mosquitoes on raisins contaminated with fowl pox virus.

5. Fowl pox was produced by inoculating the comb with a suspension of crushed mosquitoes which had fed on raisins contaminated with fowl pox virus 27 days previous. The first lesion developed 11 days after inoculation.

6. In two experiments the same mosquitoes were used, producing inoculations 2 and 27 days after their infective meal. Between the inoculating experiments the mosquitoes were fed entirely on moist raisins.

CHOLERA AND FOWL-TYPHOID

Studies on Hæmorrhagic Septicæmia Organisms, Especially on their Variability. Report I. Study on So-called Fowl Cholera Organisms. Yuichi Ochi, from Govern-Serum-Institute for Infectious Animal Diseases, Korea. Director, Dr. C. Kakizaki. Journal of the Japanese Society of Veterinary Science, 1931, p. 348.

Having studied the variability of hæmorrhagic septicæmia organisms isolated from fowl cholera (so-called P. avicida), the writer came to the following conclusions :—

1. All strains (stock culture), when cultured on serum agar, showed two distinct forms of colony. One was smaller, bluish-white, transparent and non-fluorescent, while the other relatively large, grayish-white, moist and semi-transparent and much fluorescent. The former was stable in artificial cultivation and retained permanently its property. The latter, on the other hand, was so

labile that it showed after several subculture a mixture of both forms. The fluorescent colony was described in this paper as an original fowl cholera form and the blue and transparent one as its variant.

2. Both forms of colony were almost identical with regard to their morphology, growth on ordinary culture media, indol production, nitrates reduction, hæmolysis, bile-solubility and carbo-hydrates fermentation, &c.

3. There was, however, marked difference in its agglutinability between both forms. The variants from all strains were likewise strongly agglutinated (1 : 5,000-1 : 20,000) with rabbits antisera prepared from both forms, while the agglutination titre shown by the original forms was usually low, being in some cases not higher than 1 : 50. But so far as production of agglutinin is concerned, both forms showed no distinction.

4. In respect to their pathogenicity for mice, pigeons and fowls there was also a distinct correlation between virulence and colony forms. The original type was highly pathogenic, while the variant proved less virulent or avirulent.

5. Active animal protection tests with mice showed almost no discrepancy between both forms.

6. Although varients from all strains were stable in their behaviours on various culture media, some of them could be reverted after several animal passages (pigeon).

Immunisation by Fowl-Cholera-Bacilli which have been Killed by Dyes. J. Szirtes and D. Buzna. Allatorvosi Közlöny, p. 4, 1931. (Ref. Berliner Tierärztliche Wochenschrift, p. 603, 1931.)

Bac. Avisepticus were killed by various dilutions of basic aniline dyes; acid dyes do not kill even in high concentrations. The working scale of basic colours is as follows: Methylenblue, gentianaviolet, methyviolet, brilliant-green, fuchsin. Rabbits injected with bacilli killed by dyes give a serum with a small degree of immunity.

Methylenblue, fuchsin and toluidenblue kill cholera bacilli. A solution of 0·025 per cent. kills the bacilli in 24 hours. Pigeons can stand a 2 per cent. solution in doses of 2 c.cm. but 3-5 c.cm. causes fatal intoxication.

Cholera and Poultry keeping. U. Liebling. Jugoslovenski Veterinarski Glasnik, 1931, p. 21. (Ref. Wiener Tierärztliche Monatschrift, 1931, p. 529.)

After a lengthy study the writer has come to the conclusion that good results from poultry keeping can only be obtained by useful combatting of cholera. Experiments have proved that as yet no trustworthy vaccine or serum against cholera exists.

Fowl Typhoid. T. Tomasec. Jugoslovenski Veterinarski Glasnik, 1931, p. 52. (Ref. Wiener Tierärztliche Monatschrift, 1931, p. 530.)

Success in combatting fowl typhoid was attained at a poultry farm near Zagreb by the application of blood tests and severe hygienic measures.

The Ministry of Agriculture and Fowl Typhoid. The Poultry World, April 24, 1931.

The Ministry of Agriculture and Fisheries has recently issued a new advisory leaflet on fowl typhoid, an infectious bacterial disease of fowls which is of world-wide distribution. In this country the disease has up to recent times been confined to Wales and its contiguous counties, but latterly a few

outbreaks have been encountered elsewhere. It has been considered to be a disease most frequently met with on insanitary farms and there seems little doubt that the better the hygienic conditions the less the likelihood of an outbreak of this disease. In this country the disease is mainly confined to adult birds.

The symptoms are that the infected bird becomes drowsy, loses appetite and stands in dark corners with his head drawn close to its body. Its feathers become ruffled, and the comb and wattles may become very dark and congested or unusually pale and bloodless. The most characteristic symptom is the passing of liquid droppings, which are greenish-yellow in colour and may give off a very fœtid odour. The bird becomes progressively weaker and dies after a period of illness varying between four and twelve days.

Some birds apparently suffer only a slight attack, recover, and remain carriers of the organism and sources of infection to healthy birds. Although it appears possible that infection may pass through the egg, as is the case with bacillary white diarrhœa, experiments have so far failed to prove this to be the case. There is a wide variation of the mortality caused by the disease. In some outbreaks the onset is slow, and only 10 to 30 per cent. of the flock die ; in others the onset is rapid, and the mortality may reach 80 per cent.

The means of dealing with the disease is blood-testing the affected flock, removing the reacting fowls, inoculating the healthy and thoroughly disinfecting the houses and runs. The blood test is similar to that carried out for the detection of adult fowls affected with bacillary white diarrhœa. The " carrier " birds should be removed at once from the flock, killed, and if in good condition, sold for food. The healthy birds should then be inoculated under the skin with 1 c.c. of vaccine.

Young stock may be inoculated at three months old, the dose being 0·5 c.c. Infected buildings should be scraped, swept out, and the dirt burnt. The walls and roosts should be scrubbed with hot water containing 10 per cent. caustic soda, and when dry washed or sprayed with a disinfectant, such as 5 per cent. solution of carbolic acid, or 2 per cent. formalin, or other reliable disinfectant. The infected runs should be dressed with quick-lime at the rate of about two tons per acre. Dead birds should be deeply buried or, preferably burnt.

Vaccine is prepared at the Ministry's Veterinary Laboratory, Weybridge, Surrey, and following the diagnosis of the disease may be obtained on application.

An Unusual Form of Fowl Cholera. F. Thorp, Jr., W. A. James, and R. Graham. North American Veterinary, 12, 1931, No. 2, pp. 37-41, figs. 3.

This is a contribution from Illinois on a sporadic disease of pullets which is characterised by leg weakness, loss of appetite, partial paresis, emaciation, and diarrhœa, followed by death. Out of a flock of 250 fowls 75 succumbed. The gross lesions as observed at autopsy in a group of ten spontaneously infected pullets consisted of abscess of oviduct, suppurative arthritis of coxofemoral articulation, and osteomyelitis of the proximal end of femur with erosion of the articular cartilage. A single pullet failed to show all the lesions enumerated, and none of the pathologic changes were pathognomonic.

" Direct ærobic cultures from the heart blood and liver remained sterile. Three spleens and three kidneys yielded *Pasteurella avicida*, while either the bone marrow of the femur or tibia in each of the ten pullets examined yielded *P. avicida*. Animals (rabbits and guinea pigs) injected with a composite emulsion of the bone marrow promptly succumbed to a *P. avicida* bacteremia."

The affection was diagnosed as fowl cholera with Pasteurella localisation and abscessation involving oviduct, articulations, and bone marrow of femur and tibia.

PARALYSIS

Acute Neuro-lymphomatosis gallinarum in a Strain of Rhode Island Red Fowls. H. P. Bayon. The Veterinary Record, September 5, 1931.

Conclusions.

1. An acute outbreak of neuro-lymphomatosis gallinarum was observed in a small holding among 65 R.I.R. six-month-old pullets. Eleven were affected, of which seven died ; one was killed for microscopical examination, three improved considerably after being fed with lettuce, but one relapsed after five days and recovered again later ; these and ten control fowls are still under observation ; of these ten controls five have definitely improved.

2. The differential count of the white blood cells exhibited a definite increase of the cells of the lymphoid series, apparently originating in the marrow, in which corresponding lesions were found.

3. The diagnosis was based on the microscopical examination of the brain, peripheral nerves and inner organs. Particularly the cerebral cortex showed peri-vascular " cuffs " of cells of lymphoid origin and the sciatic nerve spindle-shaped accumulations of similar cells. In the liver, spleen, kidney, intestines scattered and increased groupings of lymphoid cells were easily detected.

4. The peri-vascular cuffs surrounding distended lymphatics in the cortex consist mainly of cells originating from the circulation with a small admixture of endothelial and glial cells. It appears therefore that this disease belongs anatomatically to the pathological group which comprises both lymphocythæmia and lymphomatosis, but with the clear distinction that the most striking effects are due to lesions localised in the central and peripheral nervous system.

5. The name " Neuro-lymphomatosis " is preferable to those which do not clearly indicate the pathogenesis of the principal lesions.

6. This outbreak differed from others published and seen because the acute disease not only produced more intensive symptoms such as neck-paralysis, but did not exhibit the gross lesions seen in the more chronic course, such as swellings of the peripheral nerves, diffuse cerebral alterations, striking tumour-like deposits of lymphoid cells in the inner organs and tissues.

7. In this and other outbreaks the disease was restricted to the progeny of certain strains, though the symptoms developed about the age of six months.

8. Neuro-lymphomatosis gallinarum appears to be spreading owing to the prevalent habit of " disposing " of the flock once the ailment is recognised.

9. Hygienic measures and preventive treatment are discussed.

Notes on the Pathology and Treatment of Neuro-lymphomatosis gallinarum Observed on Fowls during Eight Outbreaks. H. P. Bayon. Molteno Institute for Research in Parasitology. University of Cambridge. The Veterinary Record, 1931, p. 1,221.

The observation of neuro-lymphomatosis in the field seems to indicate that though several different parasitic infestations, but more particularly Davainea proglottina and coccidia, may initiate paralysis, yet the acute and chronic form of the disease, Neuro-lymphomatosis gallinarum may develop without the presence of such parasites.

Treatment : 38 fowls with paralytic symptoms were obtained from eight different sources. Eight fowls served as controls, 12 fowls were cured by the feeding with fresh lettuce leaves.

Among the different conditions conducive to the development of the disease, nutritional influences appear to play a certain part. An alteration of the food formula in the early stages may be indicated, with particular attention to the supply of wholesome greenstuff (this does not include rank grass).

The Hæmopathies of Laboratory Animals. H. P. Bayon. Molteno Institute for Research in Parasitology, University of Cambridge. Proceedings of the Royal Society of Medicine, June, 1931.

The difference between hæmopathies (which originate in the blood-forming tissues) and blood-diseases (which develop in the blood-stream) is explained and illustrated by examples and specimens.

Primary anæmia caused by the hyperplasia of the erythroblastic tissues in the marrow occurs in fowls as erythromyelosis. This condition can be experimentally transmitted, though inoculation in fowls may reproduce the anæmic disease, or give rise to a persistent poly-erythrocythæmia. On farms erythromyelosis is often, but not always, associated with the cestode, Davainea proglottina.

Follows description of: lymphocythæmia, lymphomatosis, monocythæmia, leucocythæmia, the differential diagnosis of avian hæmopathies.

A New Factor in the Study of Fowl Paralysis and its Prevention. Paper Read at the Surrey Poultry Conference—Eggs, December 16, 1931.

Summary.

1. The type of grit normally acquired by the domestic hen is relatively insoluble in the gastric juices, and as such acts as a triturating agent in the gizzard, without which the digestive tract functions imperfectly.

2. The type of grit most frequently fed to poultry by modern poultry keepers contains a very large proportion of soluble salts, chiefly calcium carbonate, which rapidly disappear from the gizzard by dissolution in the gastric acids, and in consequence improper mastication of foodstuffs occurs with subsequent " indigestion."

3. It is suggested that one factor in the causation of the certain avian diseases, amongst which may be included so-called " fowl paralysis " is the feeding of grit of improper constitution. Devitalisation of the intestine occurs and toxins are absorbed into the general system.

4. A discussion of the possibilities of this theory in relation to modern poultry feeding is incorporated.

5. Physiological factors bearing on the health of the young chick are appended.

Fowl Paralysis. K. D. Downham, Veterinary Adviser, Harper Adams College. Feathered World, September 11, 1931.

Opinion varies as to the cause of the disease, first described in 1907 by Marek. Some of the suggestions put forward are as follows : a filterable virus, faults in nutrition, especially with regard to the high protein content of the food, deficiency in the calcium or phosphorus content of the blood, metallic poisons acting upon the nervous system, intestinal worms and coccidiosis.

The result of an enquiry in England showed that the commonest symptom was emaciation, paralysis of the legs and wings, followed, and the least common symptom was blindness. The disease appears to have assumed a serious proportion in the year 1930.

During the Harper Adams Conference a resolution was proposed that the National Poultry Council be urged to impress upon the Ministry of Agriculture the importance of more research facilities being given to disease problems.

Paralysis in Fowls. H. P. Hamilton. The Feathered World, September, 7, 1931.

Dr. Hamilton has decided to devote two large laboratories attached to his institution to research into the etiology and possible cure of this condition. He has engaged the services of two highly qualified assistants. From time to time the results of the experiments will be submitted both to the Ministry of Agriculture's Laboratory at Weybridge and also to the Wellcome Research Laboratory at Beckenham.

Fowl Paralysis. Miss G. H. Warrack and T. Dalling. Eggs, August 19, 1931.

The disease was first recognised in England by Galloway in 1928. The authors have been intimately associated with the disease for the past two years, and their investigations would show that it is spreading at an alarming rate, very few countries being free from it. The most commonest symptoms are : Lameness, drooping of the wing, general paralysis, twisting of the head and neck, rapid loss of condition, blindness, swollen crop, gasping, diarrhœa.

The microscopic examination of brain, nerve, tumour, &c., from an affected bird usually shows a very definite and diagnostic picture.

Authors have carried out many experiments in attempts to ascertain the actual cause of fowl paralysis. They shall not be at all surprised if the ultimate findings lead to conclude that the disease is a specific entity and is caused by a virus. They have been able to transmit the disease to healthy birds. The incubation period is at least two months. Presuming that the disease is caused by a virus there are some grounds for believing that egg transmission is possible and even likely.

It may be wise to destroy all obviously affected birds. The breeding stock should be free from any visible signs of the disease.

Fowl Paralysis. G. H. Warrack and T. Dalling. Wellcome Research Laboratories, Beckenham, Kent. Eggs, February 24, 1932.

Conclusions.

From our experiences, observations and experiments, we feel justified in making the following conclusions :—

1. " Fowl Paralysis " exists as a specific disease and can only be diagnosed by a study of the history of the outbreak in the flock, the symptoms presented by affected birds, post-mortem observations, and, if necessary, the use of the microscope. All cases of paralysis in fowls are by no means true fowl paralysis—in fact, the disease may be present in birds without there being any evidence of paralysis.

2. The disease can be transmitted to healthy birds by artificial means.

3. The disease may exist without the presence of intestinal parasites, including coccidia and can be reproduced in birds which have never been exposed to such parasitic infestation. We agree that coccidia and other intestinal parasites are prevalent in many outbreaks, but our opinion is that they are not primarily concerned in the causation of fowl paralysis. It seems probable, however, that influences such as coccidia, parasites, errors in feeding, in-breeding, &c., have some effect on its incidence.

4. We do not know the actual cause of fowl paralysis. The results of our experiments indicate that it is caused by a filterable virus contained in some of the tissues of affected birds.

5. It seems almost certain that the disease may be transmitted through the egg and that the chief source of spread is the importation of eggs for hatching, day-old chicks, pullets, or cockerels from affected stock. We are of opinion that in many cases it is well-nigh impossible to diagnose the condition in some breeding stocks whose progeny develop fowl paralysis, and thus on some occasions, the poultry keeper is entirely ignorant of the fact that his breeding stock is a source of infection ; it is not till the progeny exhibit definite symptoms when two to six months of age, that he may suspect latent infection in the parent birds. We also believe that under ideal rearing conditions, &c., the disease may remain latent in a breeding stock for several generations. The hen with the typical fowl paralysis ovarian tumours would seem to be bound to transmit infection to her chicks.

6. We know of no definite curative or preventive measures, save the elimination of the diseased (patent or latent) breeding stock, and we feel that the various methods advocated are palliative in that they merely mask the existence of the disease by preventing or retarding the development of symptoms in the treated birds, and so tend to allow the condition to be carried over into the next or subsequent generations.

Field Observations on the Spread of Fowl Paralysis by Eggs and Young Chicks. G. C. Marginson and C. A. McGaughey. Veterinary Record, 1931, p. 573.

Paralysis is more prevalent in England than was first thought. The disease could be transmitted by the hatching of eggs from test birds. These experiments were confirmed by practical experiences. From a report concerning 17 infected flocks it appears that the disease can be spread by eggs and chickens. Eggs and chickens should therefore only be taken from non-infected flocks.

Paralysis of the Domestic Fowl. Dr. E. T. Thomas. University of Florida, Agricultural Experiment Station, Gainesville. Report for the Fiscal Year ending June 20, 1930, p. 54.

Some of the studies started in 1928 and 1929 have been completed and others are still in progress. Paralysis was not produced by the continuous use of antiseptics in the drinking water. This experiment extended over a period of 12 months. The antiseptics used were potassium permanganate, one-third teaspoonful of the crystals to each gallon of water ; bichloride of mercury, six grains to each gallon of water ; a hypochlorite solution, one tablespoonful to each gallon of water. The water was mixed up fresh daily and all birds, including the control birds, consumed about the same amounts of drinking water daily.

No cases of paralysis have been produced to date by feeding various tissues from diseased chickens to chickens of a susceptible age in which an enteritis has been artificially produced. This experiment is being continued since not enough birds have been used to give conclusive results. Another experiment is being conducted in attempting to find the causative agent by feeding different tissues from paralysed chickens to birds known to be heavily infected with chronic coccidiosis. No conclusions have been reached in this experiment, since it has not been in progress a sufficient length of time to permit of definite conclusions being drawn.

In studying the autopsy records of all paralysed chickens examined during the time this work has been in progress it has been observed that an enteritis was present in every case of the disease.

It may be Fowl-Paralysis. Dr. E. M. Gildow. University of Idaho. Poultry Tribune, July, 1931.

From every section of the country come reports that this disease is spreading, particularly in the East and Middle West. Only a few birds are

diseased at one time, but others gradually become affected. Most often the disease first shows up about the time the birds are placed in the laying house. From 5 to 50 per cent. of the young birds die each season in affected flocks.

Many individuals are of the opinion that this disease is transmitted from the parent stock to baby chicks. There is abundant evidence, however, of the production of clean, healthy pullets from parent stock that was severely affected with paralysis.

No medication has been found to be of benefit in the control of this disease. Extension field work indicates that it can be controlled by sanitary measures. At the present time, a programme outlined to control intestinal parasites and soil borne diseases is the best assurance of freedom from this infectious paralysis.

Fowl Paralysis. T. R. Beaudette and C. B. Hudson. New Jersey Agricultural Experiment Station, New Brunswick. Hints to Poultrymen, August, 1931.

This disease has been referred to as range paralysis, neuritis and neurolymphomatosis gallinarum. The disease constitutes a clinical entity and has but one primary cause. There can be little doubt that this disease is transmissible. This automatically eliminates poisons or faulty nutrition as a primary cause. Typical fowl paralysis occurs in spite of the absence of coccidia and other parasites. The disease has been reproduced by the inoculation of diseased nervous tissue.

The visible changes in the nerves are not proportionate to the degree of paralysis, often no change is seen at all. The ovary frequently appears to be tumorous.

The incubation period of the inoculated disease is about three months. These facts seem to indicate transmission through the egg.

In the prevention of this disease the only sound procedure is to purchase hatching eggs, chicks or breeding stock from flocks that have never shown a case of paralysis.

Experiments Regarding Fowl Paralysis. A. M. Pappenheimer, L. C. Dunn, S. M. Seidlin. Journal of Experimental Medicine, January, 1929.

Neuro-lymphomatosis gallinarum is a disease complex with characteristic clinical and pathological symptoms. The symptoms which appear at the age of three to eight months are symetric progressive paralysis of the wings and legs and less frequently, of the neck. In some cases a gray discolouration of the eye, accompanied by blindness, is also observed. The disease is usually fatal but spontaneous recoveries have also been known. Pathological changes : extensive infiltration of the periphery nerves with lymphoid cells, plasma cells and large monomuclus leucocysts and as a result of this meyeloid degeneration of the nerve centres attacked ; a few perivascular infiltrates are also found in the brains.

In cases where changes in the iris occurred infiltration of lymphoid cells and plasma cells were found. In a large number of cases lymphoms were observed in the intestine. Infiltrations were also found in apparently healthy fowls which might possibly signify a mild form. No virus could be found in the tissues by culture but after injection of suspensions from the brains, and nerves of diseased poultry, in newly hatched chickens, paralysis occurred in 25 per cent. of the cases after two to four months. With a 50 per cent. solution of glycerine at refrigerator temperature the virus did not lose its activity.

OTHER CONTAGIOUS DISEASES

The Susceptibility of the Guinea Fowl to Brucella Disease. M. W. Emmel and I. T. Huddleson. Journal of the American Veterinary Medical Association, 1931, p. 228.

Summary.

According to experimental data, the feeding of massive doses of two strains of each of the species of the genus Brucella produced an infection in the guinea fowl which was not fatal within 120 days.

The lesions were similar to those produced in other species of birds by the same infection. What appears to be a case of natural Brucella infections in two guinea fowls has been described.

Are Hens Susceptible to Infection with the Bacillus of Johne's Disease (Para-tuberculosis)? Dr. T. van Heelsbergen. The Journal of Comparative Pathology and Therapeutics, Vol. 44, 1931, p. 213.

Experiments by author proved that mature hens are insusceptible to infection with para-tubercle bacilli. The para-tubercle bacilli which had been introduced evidently disappeared from the body without leaving a trace.

Possibly young fowls may be more susceptible and, from this point of view, it may be necessary to repeat the experiments with para-tubercle bacilli on chickens.

Experiments with Fowl-Pest and Stegomyia ægyptia. Ubertragungsversuche mit Geflügelpest und Stegomyia ægypti. O. Nieschulz, A. Bos and Tarip. Zentralblatt für Bakteriologie, Originale, Tome 121, 1931, p. 413.

Summary.

Experiments were carried out in connection with the possibility of transmitting fowl pest by means of Stegomyia ægypti (S. Fasciata). By means of intramuscular injection of pulverised mosquitoes the presence of the virus was proved six days after the infection. After 8-15 days, the experiments on 175 subjects proved negative. The virus does not, therefore, develop in the mosquitoes.

One hundred and twenty experiments with the suction of mosquitoes proved negative. Even with the presence of the virus in the intestines the mosquitoes are not infectious. Stegomyia ægypti does not, therefore, play any part as a carrier of pest.

Experiments with Fowl-Pest. Z. Morcos, Cairo. The Veterinary Record, Tome 11, 1931, p. 61.

In contact and vaccination the incubation period was 2-9 days. Serum, blood-corpuscles and the liquid in which these were washed proved to be infectious. Of a dilution of 1 : 1,000,000 ; 0·1 cm. was still virulent. No immunity could be caused by heated virulent blood. It was caused, however, by spleen emulsion which had been treated with formalin. This method is not suitable for general use as the quantity of vaccine which can be prepared from one spleen is only sufficient for 30 birds.

Experiments with Fowl-Pest. Untersuchungen über das Virus der Hühnerpest. IV. Mitteilung. R. Doerr, S. Seidenberg, L. Whitman. Hygienisches Institut der Universitat Basel. Zeitschrift für Hygiene und Infektions Krankheiten, T. 112, p. 732.

Conclusions.

1. The blood serum of sick birds is in various degrees infectious. The minimum dose causing sickness varies from 10^2 to 10^7 c.cm.

2. Virus containing serum remains virulent in a refrigerator for at least 60 days.

3. In the brains of rabbits, guinea-pigs, white mice and frogs, the virus remains virulent for fowls for a lengthy period.

If the virus is intravenously injected into the above-mentioned animals, it quickly disappears.

4. The virus in the brains does not disappear gradually but suddenly. The auto-sterilisation is a vital process. The virus remains alive in the brains of dead animals.

5. There are differences of opinion with regard to the sensitiveness of mice, guinea-pigs and rabbits to pest, which must be further investigated.

Observations on a Disease of Fowls due to a Filterable Virus and Associated with Leucocytic Inclusions. S. J. Gilbert, G. B. Simmins. Government Veterinary Laboratory, Jaffa, Palestina. The Journal of Comparative Pathology and Therapeutics, 1931, Vol. 44, p. 157.

Conclusions.

1. The disease of fowls previously described by Macfie and Adler, which is not uncommon in Palestine, is caused by a filterable virus.
2. The disease is nearly always associated with leucocytic inclusions.
3. A great variation occurs in the virulence of the virus.
4. The virulence can be raised by rapid passage.
5. A period of immunity follows both acute and mild attacks.
6. Native fowls are at times susceptible to acute outbreaks.

Infectious Trachitis. Charles S. Gibbs. Massachusetts Agricultural Experiment Station. Massachusetts State College, Amherst, Mass. Bulletin No. 273.

Summary.

1. The name infectious trachitis is suggested for the disease sometimes called infectious bronchitis, tracheolaryngitis, chicken flu, and Canada flu, because it is short, easily pronounced, and descriptive of the symptoms and chief lesions.

2. The prevalence of infectious trachitis in Massachusetts previous to 1920 and 1921 is uncertain. However, it is known that the disease has progressively existed in the State since 1921.

3. The clinical symptoms of infectious trachitis, as noted in this study were pale face, ruffled appearance of the feathers, lacrimation of the eyes, elevation of temperature, lack of appetite sometimes accompanied by emesis, cyanotic colouration of the comb and wattles, dyspnea, weakness, the formation of pseudomembrane in the visible parts of the respiratory tract, swelling of the infraorbital sinuses, death due to suffocation, toxemia, or general debility.

4. Gross lesions of infectious trachitis were especially prominent in fowls and absent in young chickens dead of the disease. The most common lesions of infectious trachitis revealed by this investigation were desquamative epithelial inflammation of the trachea, the formation of pseudomembrane in the respiratory tract, congestion and sometimes fatty degeneration of the liver, inflammation of the spleen and hæmorrhages of the kidney. Congestion and consolidation of the lungs occurred in a few cases.

5. The histopathology of infectious trachitis varied considerably in individual birds. The following lesions were usually found in this study: hyperemia of the trachea, larynx and abdominal organs, desquamative inflammation of the ciliated epithelial layers of the trachea and larynx; fibrino-purulent infiltration of the mucosa of the trachea; hæmorrhagic infiltration into the alveolar spaces of the lungs, tubular spaces of the kidneys, and the mucosa and submucosa of the trachea; inflammation and sometimes fatty degeneration of the liver. Inflammation of the spleen was observed in some cases.

6. Viruses from acute field cases of infectious trachitis were successfully propagated under laboratory conditions. Viruses from chronic field cases of infectious trachitis lost their potency when transmitted in series under laboratory conditions.

7. Viruses from the acute field cases of infectious trachitis studied in this investigation were filterable. These viruses consistently passed the pores of Berkefeld V and Seitz filters in sufficient quantities to successfully inoculate fowls, pullets, cockerels, and chickens. Some of the viruses were partially retained by the Berkefeld N filters, used in these experiments, so that susceptible birds were not always successfully inoculated with the filtrates. These viruses were not demonstrated in the filtrates passing through Berkefeld W filters.

8. Fowls, pullets, cockerels, and chickens were not successfully inoculated by the subcutaneous method.

9. Six chickens inoculated intravenously with the virus of infectious trachitis failed to develop the disease, while the controls inoculated intratracheally with the same virus died.

10. Comparative studies of infectious trachitis from Massachusetts, California, and New Jersey showed immunological differences between acute and chronic cases.

11. The virus of the second California strain of infectious trachitis was demonstrated in the macerated tissues of the liver, spleen, trachea and kidney of chickens dead of the disease.

12. Two healthy carriers of infectious trachitis were found, in which the virus remained viable in the tracheal exudate for two and four weeks, respectively, after all visible symptoms of the disease had disappeared.

13. The virus of infectious trachitis was demonstrated in the cloacal contents of three of the birds infected with the first California virus and four of the cockerels and pullets suffering from an infection with the first New Jersey strain.

14. Chickenpox vaccination did not protect domestic fowls against infectious trachitis.

PARASITES

COCCIDIOSIS

Can Coccidiosis be controlled by Diet? A Discovery at Wye College, Wye, Kent. The Feathered World, 1931, August 7.

Observations made at the Southern Table Poultry Experimental Station, Wye, tend to show that in coccidiosis of chickens the diets of the birds exerts a material influence upon the disease.

Batches of newly hatched chicks were placed in six hiver houses. In each house 94 chicks were placed. In three houses the chicks were fed the usual Institute ration, in three houses they were fed upon a store ration.

By the end of the seventh week, 256 birds out of 272 birds fed upon the store ration had perished from coccidiosis, and the remainder were too unthrifty to make further rearing profitable. As against this, at the end of the eighth week, only 39 birds fed upon the usual Institute ration had died from disease. The following week eleven were killed because of being unthrifty, and 222 birds were drafted into the fattening pens.

The deliberate infection of pens had little effect upon the course of the epizootic, and the experiment illustrates in no uncertain manner the impossibility of excluding coccidiosis from brooder houses under ordinary farming conditions, even though all ordinary precautions are taken.

Finally, the experiment strongly indicates that the nature of the ration plays a vital part in determining whether chickens are going to withstand or succumb to coccidiosis infection, an infection which the great majority of chickens are exposed to.

It is hoped that the necessary aid may be available to continue this investigation, both under controlled laboratory conditions and in the field, where the important factor or factors in the diet may be arrived at by adequately planned experiment, and further knowledge concerning the relationship between the parasite and the host obtained.

The Control of Coccidiosis. H. J. Stafseth. Michigan State College. Poultry Craftsmen and the Pacific Poultryman, September, 1931, p. 24. A Paper as given before the International Baby Chick Association.

Description of : Reproduction and spread, effects of germicidal agents, habits of the host, susceptibility and resistance, control measures, disposal of litter and droppings, feeding and medication, cures.

No drug or remedy known to-day can penetrate to the deep seated focus of infection and kill the coccidia. Milk probably improves the nutrition of the birds so that they are enabled to withstand the effect of the infection, while iodine may neutralise the toxins incident to the disease process, thereby aiding the bird through its illness.

It has been suggested that the logical way to control this disease is by the exposure of young birds to moderate doses of coccidia. Since we know that four or six different species of coccidia affect the domestic fowl, none of which confer immunity against any other species, immunisation cannot be considered a rational system of control at this time.

Experimental Studies on Eimeria Avium. Sucichi Nohmi. Zootechnical Experiment Station, Chiba, Japan. Journal of the Japanese Society of Veterinary Science, 1931, p. 323.

The process of development of E. avium in the host has been studied by five series of experiments in which 78 chickens hatched in incubators were killed 30 minutes to ten days after they had been given sporulated oöcysts and each section of their intestine from duodenum to rectum was carefully investigated.

This article is illustrated with a great number of micro-photos and drawings.

The experiments further show that the coccidium of hens never lives on turkeys, pigeons, sparrows or ducks.

The Laboratory Diagnosis of Coccidiosis. Report of the Ontario Veterinary College, 1928. Toronto, Ontario, 1929, p. 34.

Description of post-mortem findings and differential diagnosis.

Some of the forms which abound in typical cases of coccidiosis and unquestionably represent a stage in coccidial development, are not to be found amongst those described in the standard charts of the coccidian life-cycle, while many of the forms shown in such charts are rarely, if ever, seen in diagnostic work.

Author gives a description with plates of these forms.

Infection with Heterogenic Coccidii. Zur Frage der Infektion der Tiere mit heterogenen Kokzidien. Prof. Dr. W. L. Yakimoff and P. S. Twanoff-Gobzem. Parasitologisches Laboratorium der Tierärztlichen Hochschule, Leningrad. Zentralblatt für Bakteriologie, Originale, Tome 122, 1931, p. 319.

Conclusions.

1. The mature oöcysts of rabbit-coccidies of both species (Eimeria stiedæ, E. perforans and E. magna) pass through the intestines of dogs, hens, pigeons, white rats and mice unchanged after feeding.

2. Mature chicken-oöcysts pass through the intestines of rabbits, pigeons, white rats and mice without making these animals sick.

3. Mature pigeon-occysts fed to rabbits, hens, rats and mice pass through the intestines without causing infection.

On the basis of these tests the writers agree with Nischulz, that pigeon-coccidies are an independent species and in the name Eimeria pfeifferi are not synonym with E. tenella as assumed by Hofkamp.

4. It is impossible to infect other animals with rabbit-coccidies (Eimeria stiedæ, E. perforans and E. magna) and with chicken-coccidies (Eimeria pfeifferi). Rodents (rats and mice) may be mechanical spreaders of infection as unripe oöcysts can still form spores after passage through the intestinal canal of these animals.

The Distribution of Coccidial Oöcysts on a Poultry Farm in Maryland. J. Andrews and H. Tsuchiya. John Hopkins School of Hygiene, Baltimore, Maryland, Poultry Science, Vol. X, No. 6.

Summary.

Counts of oöcysts from various samples obtained on a poultry farm indicate that the oöcysts are most numerous under perches, brooding canopies, in and around drinking fountains, and around food hoppers. It is suggested that the birds be prevented from access to these sources of infection by the installation of suitable platforms of wire mesh to cover these heavily infected situations.

Experiments regarding the Parasitical Specification of Coccidii. C. Corcuff. Annales Parasitol. Humaine et Compar, 1928, p. 404.

By the feeding of completely segmented oöcysts of Eimeria stiedæ, the cause of rabbit coccidiosis, the writer proved that all oöcysts were excreted on the first day ; from this he concludes that rabbit coccidiosis is in no way

connected with the intestinal coccidiosis of chickens. (Ref. Der Oesterreichische Tierärzt, June 8, 1931.)

Experiments with Coccidiosis. Untersuchungen über die Coccidiose der Hühner. M. Zunker Veterinär-abteilung des Reichsgesundheitsamtes, Dahlem. Archiv. für Geflügelkunde, 1931, p. 171.

The writer noticed that the excretion of coccidies varies considerably one day with another. Coccidies in artificially infected chickens disappear quickly after the birds have been put on wire-netting in batteries.

The name chronic coccidiosis is incorrect as in reality it is a continual row of renewed infections.

The wire-netting floor is recommended as the best remedy.

Coccidiosis. Les Coccidioses Aviaires. J. Nerge. Recueil Médecine Vétérinaire, 1931, No. 2.

The work refers to the usual classification of avian coccidii in Eimeria tenella of poultry, Eimeria pfeifferi of pigeons and Eimeria truncata of goose, but also refers to the division of the primary form by Tyzzer in poultry species : Eimeria tenella, mitis, acervulina, maxima. Pheasant species, Eimeria phasiani, dispersa and in turkey species : Eimeria maleagridis, maleagrimitis. After a comprehensive discussion over the clinic of coccidiosis, the therapy is discussed, in which the modern milk treatment, with skimmed milk and buttermilk, is propagated. The prophylax is naturally of great importance.

B. Welchii and Coccidiosis. H. W. Bennets. The Australian Veterinary Journal, T. 7, 1930, p. 153.

A case of coccidiosis with infection with B. Welchii in a hen is described. The toxin formed by B. Welchii caused death.

Coccidiosis among Ducks. Peracute sterfte bij Eenden, verzaakt door Coccidiosis. Dr. J. Jansen. Tijdschrift voor Diergeneeskunde, 1931, p. 1273.

Summary.

Coccidiosis among ducks is of sporadic occurrence in Holland. However, a serious outbreak of acute coccidiosis was recently observed on a duck farm. Of 700 ducks more than 10 per cent. died within 48 hours. (Other diseases could be excluded.)

OTHER PARASITES

Spirochætes and the Central Nervous System. Ueber das Verhalten der Geflügelspirochaten zum Zentralnervensystem. F. Jahnel, Forschungsanstalt für Psychiatrie, München. Zeitschrift für Hygiene und Infektionskrankheiten, T. 112, p. 613.

Experiments proved that, contrary to other spirochætes, fowl spirochætes remain alive in the nervous system long after the termination of the crisis. They can still be observed in the brains long after they have disappeared from the blood and inner organs.

Spirochætosis in Switzerland. Geflügelspirochætose in der Schweiz. L. Riedmüller. Schweizer Archiv für Tierheilkunde, T. 72, p. 8.

The writer found spirochætosis in Switzerland for the first time in 1926. The post-mortem changes strongly resemble those in cholera and leucosis. Nothing is known of the origin of the disease. It is not possible to infect other hens artificially.

Cordulia ænnea L., Ein neuer Hilfswirt fur Prosthogonimus Pellucidus v. Linstow, den Erreger der Trematodkrankheit der Legehühner. Szidat. Zentralblaff für Bakteriologie. Abt. I, 1931, p. 289.

In 1926 the writer succeeded in proving that the spotted dragon-fly Libellula quadrimaculata, is one of the carriers of Prosthogonimus pellucidus, the cause of the thin-shelled-eggs disease, The cercaries-cysts of this trematode were shown in the above-named dragon-fly and the larvæ thereof and it was possible to transmit the parasite and the disease by infecting poultry with these cercaries. The snail, in which these cercaries develop is not yet known however. Szidat tried to solve this problem by experiments in infected areas. Although he did not succeed in finding these snails, he did, however, make a very important discovery. This was that the larvæ of a second species of dragon-fly, namely, Cordulia æna, were also infected with cercaries of prosthogonimus. He found cercaries-cysts in 90 per cent. of these larvæ.

These larvæ crept in large numbers from the water (a lake in a wood in East Russia) so that the banks were entirely covered.

Contrary to Libellula quadrimaculata the adult Cordulia æna remain in the neighbourhood of their birthplace. They do not make long journeys. This latter kind of dragon-fly will not cause the spread of Prosthogonimus pellucidus.

Owing to their distant journeys Libellula quadrimaculata can bring the disease to areas in which it has never before been known.

The fact that the larvæ of Cordulia æna creep so far inland makes it difficult to protect poultry from them. Even if the poultry are prevented from going near the water and are kept shut up in pens into which the dragon-flies cannot penetrate, it will always remain possible for the larvæ of Cordulia æna to creep into the pens. If the poultry eat these larvæ they become infected with the cercaries-cysts from which Prosthogonimus pellicidus develops. These dragon-fly larvæ appeared to be so strongly infected with cercaries-cysts that after the eating of a single larva by a test-hen, 30 examples of Prosthogonimus pellucidus developed in the oviduct.

Parasites in Domestic Birds. Die Parasiten des Hausgeflugels. 5. Untersuchungen über die Entwicklungsgeschichte und die Biologie von Filicollis anatis Schrank, eines Kratzers aus dem Darm unserer Entenvogel und seine Uebertragung, durch Wasserasseln. L. Szidat. Archiv. f. Geflügelkunde Jg. 5, 1931, p. 90.

The development of the small Acantocephalus, Polymorphus minutes, which is usually noticeably orange coloured, is known. This parasite, which lives in the intestines of wild and tame ducks, is probably less harmful than the larger Filicollis Anatis. A typical feature of this parasite is the trunk with rows of small hooks which penetrate the walls of the intestines of the host. The females of the Follicollis Anatis, which sometimes attain a length of 2·5 cm., not only penetrate the wall of the intestines, but sometimes pierce even the

muscularis, so that finally the trunk is only covered by the thin layer of the peritoneum. The trunk now swells, simultaneously with the fore part of the neck of the parasite, which causes the characteristic protrusions on the outside of the intestines.

As it is assumed that the Acantocephales do not enter the intestines, nose or anus, Szidat considers it is not impossible that this perforation of the intestines is connected with the feeding of the parasite. It is often noticed that even the trunk which has pierced the intestines of the bird, is no longer covered by the peritoneum so that there is direct communication between the parasite and the abdominal cavity of the bird. The osmose might play a part in the food of these parasites.

As, for the purpose of egg production, the females need more food than the males, Szidat assumes that the females perforate the walls of the intestines while the males only penetrate as far as the pituitary membrane. The eggs of Follicollis anatis are 62-70 u.m. long and about 20 u.m. wide. Contrary to the eggs of the Polymorphus minutes, which are more spool shaped, the eggs of the F. anatis are oval. The eggs are enveloped in three layers of which the middle one is the thickest.

A developed embryo is found in the eggs. The intermediate host of Polymorphus minutes is Gammarus pulex.

As regards Fillicollis Anatis, Szidat has shown that Asellus Aquaticus (water millipeds) acts as intermediate host. He has discovered the larvæ of F. Anatis in Asellus Aquaticus and he succeeded in causing an experimental infection in ducks.

The larvæ, as these occur in Asellus Aquaticus, are enveloped in a clear, strong shell. This shell probably serves to protect the larvæ when they pass the stomach of the duck on their way to the intestines.

The larva appears in this shell as an oval body, white and opaque. If the larva is freed from the egg, the neck and trunk, which were at first invisible, can be pressed out. These larvæ are about 1·9 mm. long.

Some especially good photos give a clear likeness of the various stages of development of this parasite.

A New Roundworm Parasite, Strongyloides avium of the Chicken, with Observations on its Life History and Pathogenicity. E. Cram. North American Veterinarian, Chicago, 1929, p. 27.

Nematodes belonging to the tribe Strongyloides were found in the cæca of six chickens, all taken from different flocks. This is the first time that these have been found in hens. As this species show clear differences as compared with the Strongyloides species known in birds, the writer gave them the name Strongyloides avium. Up to this time the Strongyloides in birds appeared in all cases to belong to the species known as Strongyloides stercoralis ; these are, however, only found in exceptional cases. In Strongyloides avium a free living generation of male and female examples also occur. The development is therefore analogue to that of the species already known.

In cases of light infection no symptoms of disease were observed. In experimental severe infections a thin bloody content was found in the cæca. The wall of the cæca was swollen while the lumen was completely filled with degenerated tissue mixed with slime and red blood cells.

Life Histories of Six Parasites is Revealed. Poultry Culture, June, 1931.

The life histories of six poultry parasites, nematodes of the superfamily Spirurodea, have been demonstrated for the first time in this country by Dr. Eloise B. Cram, Zoologist of the Bureau of Animal Industry, U.S. Department of Agriculture, and are described in Technical Bulletin 227-T,

just issued by that department. The bulletin, which is intended especially for zoologists and veterinarians, explains that these nematodes were found to exist in seven intermediate hosts which were heretofore unknown as hosts. These discoveries double the number of life histories known throughout the world for similar nematodes which are important parasites of poultry and game birds.

The bird hosts in which infestations were produced in the experiments described by the author include chickens, ducks, pigeons, bobwhite quail, and ruffed grouse. The intermediate hosts include dung beetles, cockroaches, grasshoppers, and isopods. The bulletin describes and illustrates each parasite in the various stages of its development and reports observations on its location in the body at different times, and on the period necessary for its complete development in the intermediate and the final hosts. It also discusses clinical and pathological effects of the infestations.

Ornithostrongylus quadriradiatus in Squabs. A. Komarov and F. R. Beaudette. New Brunswick, N.Y. Journal of the American Veterinary Medical Association, 1931, p. 393.

Summary.

The etiological agent of an epizootic of pigeons, in which all but six succumbed, was found to be a nematode worm identified as Ornithostrongylus quadriradiatus.

Internal Parasites of Poultry. D. A. Sanders. University of Florida Agricultural Experiment Station, Gainesville. Press Bulletin 408.

Description of : Intestinal Worms, Roundworms and Tapeworms. Prevention and Treatment.

Worms of Poultry. S. Kotlan and D. Orosz. Allatorvosi Lapok, 1931, p. 112. (Ref. Wiener Tierärztliche Monatschrift, 1931, p. 503.)

The following are discussed : Capillaria retusa, caudinflata, annulata, columbæ, anatis, contorta and perforans. The latter is a new species found in the gullet of the turkey.

Syngamosis. La Syngamose. P. E. J. Froger. Dissertation Ecole Nationale Vétérinaire, Alfort, 1930.

Syngamus trachea of poultry and its action on the respiratory tract are discussed. History, spreading, systematic location in the zoological system together with the relative Genus Cyathostoma, local occurrence and hosts precede a detailed description of morphology and development. Then follow chapters on the changes which cause these parasites, the transmission, diagnosis, prognosis, treatment and relative results. Cyathostoma in water fowl and mammals are also treated. A review is given of the results of treatment with 5 per cent. Aniodol (Formol-Allylglycerine), which is injected into the trachæ and the giving of aniodol containing water as prophylaticum. The technique of the injection (Syringe with an extended canal in the glottis) is discussed in detail.

Treatment of Parasitic Diseases. Traitement des maladies parasitaires. E. A. R. F. Baudet. Report International Veterinary Congress, London, 1930, p. 786.

This report is confined to a few intestine parasites occurring in Holland in poultry and chiefly to those which belong to the tribes Davainea, Heterakis and Capillaria. It is pointed out that paralysis now frequently occurs in hens without tape-worms being found. It must therefore be doubted whether these parasites are really the cause of paralysis, more so as it is now known that a filterable virus can cause this paralysis.

Further experiments will have to determine in how far there is connection between leucæmie and the presence of tape-worms (Davainea proglottina).

According to the experiments carried out by Bayon these tape-worms must be present to cause leucæmie (Erythromyelosis of Bayon).

Various remedies which are used against tape-worms and some nematodes (Capillaria and Heterakis) were examined. Nicotine-sulphate, tetra-chloride-æthyline, ol. chenopodium, ol. terebinthinæ and calomel per os did not give satisfactory results. Cloacal injection with ol. chenopodium can be recommended, as most of the Heterakis can be driven away by this. Repeated treatment with camala did not drive away all the tape-worms.

Intestine worms occur chiefly in poultry between the ages of 3-4 months. Older birds are not so easy to infect. Very few remedies give satisfactory results. Time and money spent on treatment are frequently considerable.

The combatting of these parasites will, therefore, have to be sought chiefly in the prophylaxis. As is the case with infectious diseases it can be assumed that for the occurrence of parasitical disease a pre-disposition as well as the presence of the parasites is necessary. The predisposition can be increased under less favourable conditions. It is especially in the case of young birds that these preventive measures should be used by the application of the strictest hygiene.

Treatment of Parasitical Diseases in Birds. Traitement des maladies parasitaires des Volailles. J. Lahaye. Report International Veterinary Congress, London, 1930, p. 801.

Ectoparasites.—Of these the writer mentions the bugs (cimec Columbarius and C. inodorus). These attack hens and pigeons chiefly at night. The best remedy is a 1/2 per cent. fluornatrium bath ; this should be repeated three times with a six days interval.

Further the bugs should be driven from the houses, which is not so easy as they are very tough. The usual methods such as dusting with certain remedies have usually no effect. It is, therefore, best to prevent these parasites from reaching the birds. The nests and perches can be isolated by certain apparatuses which are so built that in order to reach the nests or perches the parasites must pass a gum prepared for this purpose.

Fleas.—Can be cleared by pyrethrum powder or by means of dust baths which contain pyrethrum powder, sulphur powder and powder of staphisagria seed. The fleas are not, however, killed by this. A simple method of getting rid of these parasites is to put horse manure in the houses for a few nights. The manure should be put in crates. The smell of the manure drives away the fleas.

Lice.—(Lipeurus, Goniodes, Goniocotes and Menopon) can also be driven away by 1/2 per cent. fluornatrium baths and by odyline.

Mites.—Air cas mites, according to the writer do no harm. Laminosioptes cysticola do not appear much in Belgium as Lahaye has never seen them. Body mange, caused by Sarcoptes lævis, can be combatted in the same manner as lice.

The writer recommends Helmerich salve to which 10 per cent. salicyl acid has been added as the best remedy for scaly legs (Sarcoptes mutans). Feather mites (Pterolichus, Falculifer, Dermogylphus, Megninia and Epidermoptes) can be combatted with 1/2 per cent. fluornatrium baths. The parasites belonging to the Thrombidiidæ (cheyletiella heteropalpa, Sarcopterinys nidulans, Syringophilus bipectinatus and Trombidium holosericeum) are more difficult to combat. Sulphur baths will suffice provided the mode of living of each of these parasites is taken into consideration. Ticks (Argas species) can be treated in the same manner as the Cimex. This also applies to Dermanyssus avium Lophophyton gallinæ, the parasite of bird-favus is best treated with glycerine-iodine 20 per cent. Lophophyton gallinæ is no longer specified under Favus but under the Sabouraudites tribe (Ota and Langeron, 1923) and is indicated as Sabouraudites gallinæ.

Endoparasites.—Speaking of the chief of these discussed by Lahaye we limit ourselves to those belonging to the tribe.

Capillaria.—None of the remedies recommended are able to drive away these parasites completely. Lahaye examined a whole series such as santonine, eleum chenopodium, calomel, nicotine-sulphate, camala, calcium bichromate, iron-chloride, extractum filicis, arecoline, thymol, anisseed oil, tetra-chloride-carbon, tetra-chloride, æthyline, copper-sulphate, bismuth-carbonate, &c.

He noticed that a dose of 20 mg. calomel given for a period of 3-4 days resulted in a decrease of the number of eggs in the fæces, but the number decreased no further even if the treatment was carried on for a month. Bismuth-carbonate does not drive away the parasites but causes a speedy cicatrisation of the wounds in the intestinal pituitary membrane as a result of which the infected birds gained weight more quickly.

In the first place the writer recommends hygienic measures against roundworms ; prevent food and drinking water from being infected with fæces.

Two per cent. tobacco-powder in the food can be used as a remedy for poultry ; the treatment should be continued for a month. During the treatment each 50 birds should receive 250 grams of a mixture of natrium sulphate and magnesium sulphate in equal parts. For pigeons it is better to give the tobacco powder in pill form $\frac{1}{4}$ to $\frac{1}{2}$ per day per bird for a period of two to three months.

A good remedy for tapeworms is ol. terebinthinæ or camala.

Tetra-chloride-æthyline gives good results in the combatting of intestine trematodes (Echinostomes) both in the case of tapeworms and trematodes ; the latter the intermediate host, *in casu* the snails, must be taken into consideration. Lahaye does not know any remedy against coccidii.

The writer could not recommend any good remedy against the oviduct parasites belonging to the Prosthogonimus tribe, the cause of thin-shelled eggs.

The Influence of Fly-Killers (Flit, Flisin, Quick, Agritor) on the Skin of Dogs, Cats and Poultry. Dr. Otto Muck, Vienna. Münchener Tierärztliche Wochenschrift, T.B.2, p. 373.

Experiments were carried out with a view to ascertaining how the skin of animals reacted to these remedies which have recently been so often recommended. Each remedy was used both cutaneously and orally. In accordance with the instructions for cutane treatment the animal was subjected to a ten days cure. In cats and poultry the initial dose was 1 c.cm. increased daily by 2 c.cm. Of the four remedies examined Flit proved to be the most dangerous. In the case of poultry one or two applications cause no harm. The total quantity which poultry can stand without harm per os is 625 c.cm.

Of the other remedies examined, Agritor can be safely used for animals. Certain caution is advised when using Quick and Flisin. Agritor proved quite

harmless for dogs and poultry. They can stand large quantities on the skin without any reaction taking place. No caution is necessary in the use of Quick for dogs and adult poultry. Cats and young poultry cannot stand it. Heavy vomiting and salivation took place with all animals when this remedy was fed. If the instructions for use are strictly adhered to dogs and poultry suffer no harm from Flisin. Used carelessly it can cause reddish blotches and scaliness in the skin of poultry.

Treatment of Scaly Leg. Kurze Mitteilung zur Behandlung der Fuszraüde (Kalkbeine) der Hühner. H. Haupt. Veterinar-Hygienischer Institut des Universität Leipzig. Tierärztliche Rundschau, 1931, p. 592.

The writer obtained good results with sodium-fluoride treatment. The powder should be dissolved in a pan of water at 40° C. 5 : 1,000. The hens are held by the wings and the legs placed in the solution. Each bird should remain about 15 seconds in the bath. The treatment should be repeated at intervals of 2-4 weeks.

Sodium fluoride is a dangerous poison. If there is a thick crust the legs should first be steeped in soda or soft soap and water.

Babesiosis in Poultry. Z. Morcos. Cairo. The Veterinary Record, Tome 11, 1931, p. 217.

Numerous Egyptian hens and ducks carry this parasite without showing any symptoms of disease. Imported breeds die of the infection. The course of the disease is seldom acute. Intense emaciation with anæmia usually takes place in the course of about three weeks, after which the birds die under symptoms of paralysis. Remedies are not known but in the initial stages atoxyl and neosalvarsan are useful.

The Action of the Fly and Gnat Exterminator Shell-Tox on Bird Mites. Uber die Wirkung des Fliegen- und Mücken-Vertilgungsmittels Shell-Tox auf Vogelmilben. Prof. Dr. Pfeiler, und Dr. Becker. Münchn. T. W. 1931, H. 9.

This remedy kills flies and bird mites quickly but also shows bactericide strength. It killed Staphylococcii in 15 minutes and stopped the growth of anthrax bacilli in 17 hours.

A New Fowl Mite. Liponyssus Silitarum. Prof. W. A. Maw, Macdonald College, P.Q. Feathered World, June 26, 1931.

The Northern fowl mite remains on the bird's body throughout the day. It is smaller than the red mite and greyish in colour. It has been found on a number of different kinds of wild birds and is distributed by sparrows and other wild birds. Nicotine sulphate has not proved satisfactory in all cases.

Blackhead. Altes und Neues über Blackhead. K. Ullrich. Prager Archiv. für Tiermedizin, 1931, p. 118.

The writer now reports for the first time the occurrence of blackhead in Czecho-Slovakia. Post-mortem and microscopic changes are described. There are no remedies known.

Blackhead in Turkeys. Storrs Agricultural Experiment Station, Report of the Director for the year ending June 30, 1929. Bulletin 162.

Chief emphasis was placed on ordinary barn yard fowl (chickens) as important agents in the transmission of blackhead infection in turkeys, the chickens serving as carriers.

Eariy in December, 1927, from 20 to 25 adult chickens were placed in the " Winter Control " turkey yard and kept there until June of the following year, when the new poults were ready to go into the yards. The " Rotation " and " Summer Control " yards and houses were left unoccupied during this period. The main results of the 1928 rearing season are summarised as follows :

Yards	Original number of turkeys	Death from blackhead	Number surviving
Rotation	56	5 or 8·93%	48
Summer Control	57	10 or 17·54%	44
Winter Control	57	20 or 49·12%	23

GENERAL

Report of the Special Committee on Poultry Diseases. By W. R. Hinshaw, B. A. Beach, J. R. Beach, H. W. Graybill, J. B. Lentz, H. Y. Stafseth, E. L. Stubbs. Journal of the American Veterinary Medical Association, Vol. 79, Oct. 1931, p. 522.

Summary of Recommendations.

This committee desires to submit the following recommendations :—

1. That poultry disease investigators co-operate in adopting the name " Infectious laryngotrachitis " for the respiratory disease of chickens now known by infectious bronchitis, infectious tracheitis, and infectious laryngotracheitis. As an aid to librarians and others in making cross references and in preparing bibliographies, synonyms should be included in all references to the disease until such a time as this name becomes standard by usage.

2. That because of contradictory results obtained by American investigators in the use of the pigeon-pox vaccine of Doyle, your committee recommends additional investigations before this product is generally substituted for the chicken-pox vaccine now in common use in the United States. Your committee does, however, believe that the pigeon-pox vaccine of Doyle merits further investigations and field trials.

3. That it will be desirable for a future committee on poultry diseases to prepare and publish a list of accepted names with synonyms of poultry diseases.

4. That future committees on poultry diseases act in an advisory capacity in the selection of correct, fitting and appropriate names for newly described poultry diseases.

It has been impossible, because of lack of time, to submit this report for final reading to those members who are absent from this meeting, so the responsibility for all statements is taken by those present and whose signatures appear on the report.

Poultry-Diseases. Untersuchungen im Laboratorium für Geflügelkranhheiten. Bericht über die Tätigheit des Bakteriologischen Instituts der Landwirtschaftskammer für die Prov. Sachsen in Halle a.S. 1930. Dr. Hugo Rantmann.

1,717 birds, including 666 hens and 669 young chickens, and 7,968 blood samples were examined for pullorum disease. The following infectious diseases were found : cholera, tuberculosis. This occurred in 1·7 per cent. of the young birds and in 10·0 per cent. of the old birds.

The tuberculine-wattle-test is not absolutely reliable.

Special investigations were made in connection with the occurrence of tubercle bacilli in eggs, blood and manure of hens. Similarity of agglutination results in pullorum from various laboratories were investigated. Paratyphoid, colibacillosis, erysipelas and pneumonycosis also occurred.

The following virus diseases were found : diphtheria, roup, leucosis, Marek's paralysis. This disease is often found in pure bred birds even when these were sold as chickens.

Of the parasitical diseases coccidiosis and worms were discovered. Tetra-chloride-carbon was tried against these.

Inflammation of the oviduct was the most frequent of the diseases among the hens. 26 per cent. were found to be suffering from this. Pullorum bacilli were repeatedly found in inflammation of the ovary.

The number of poultry houses has been considerably increased and important improvements have been carried out in order that more extensive studies of poultry diseases could be effected.

Poultry Diseases in the Netherlands. Overzicht van de verschillende Pluimveeziekten in Nederland. F. A. de Zeeuw. Tijdschrift voor Diergeneeskunde, 1931, p. 1047.

From the post-mortem examination of 1,737 hens by the Institute of Parasitic and Infectious diseases at Utrecht, it appeared that death resulted from the following diseases :—Inflammation oviduct 17 per cent., Pullorum Disease 8·5 per cent., Coccidiosis 8·5 per cent., Leucæmia 6·7 per cent., Intestinal Worms 6·5 per cent., Neurolymphomatosis Gallinarium 4·6 per cent., Pox 5·5 per cent., Coryra Infection 5·9 per cent., Tuberculosis 5·7 per cent., Metabolic Diseases 6·5 per cent., Hæmorrhages without a specific cause 3·2 per cent., Cholera 0·8 per cent., Enteritis 5·0 per cent., Tumours 6·7 per cent., Klein's Disease 1·7 per cent.

Poultry Diseases in Belgium. Verslag over de Werkzaamheid van het Veeartsenijkundig Laboratorium te Brussel, Gedurende, 1930.

The number of blood tests carried out for the purpose of detecting infected birds was 9,563, this being 3,000 more than last year. At certain farms which had been under control for three years, the percentage of reactors was very small. Experience has proved that continual control of heavily infected farms results in the decrease of the loss to a negligible number.

The blood test must be carried out for several years in order to be able to exercise a useful control on the condition of health in the flocks.

1,280 post-mortems on hens were carried out.

With the exception of diphtheria, infectious diseases were seldom. Fowl pest was not discovered during this year. A few cases of cholera and typhoid were found. Tuberculosis occurred 27 times.

Parasitical inflammations of the intestines were, however, numerous and caused more damage than all the other microbic diseases.

Excluding infectious diseases, the highest mortality among poultry is caused by ailments of the ovary and the oviduct, with or without peritonitis, as a result of over-feeding for the purpose of increasing the laying capacity.

It must, however, be remarked that in a certain number of cases of chronic inflammation of the ovary, B. pullorum was found. This proves clearly that poultry farmers profit in such cases by having their hens examined.

Diseases of Young Hens. Die Jungtierkrankheiten der Hühner, ihre Ursachen, Schäden und Verhütung. G. Schürmann. Deutsche Landwirtschaftliche Geflügelzeitung, 1931, p. 782.

As youth diseases are considered those diseases between the age of six weeks until the hen is ripe for laying. The following belong to these : (1) Pullorum ; (2) Leucæmia ; (3) Pox ; (4) Enteritis caused by round worms ; (5) Gout ; (6) Diseases of the intestines. These diseases are discussed consecutively. In the description of pullorum the advice is given to have the breeding birds examined twice, once during youth and again before the beginning of the breeding period. In leucæmia other factors besides the virus play a part (weakening by breeding, &c.).

Diseases of Growing Flocks. Dr. B. T. Kaupp, New York. Poultry Culture, May, 1931, p. 7.

Chronic coccidiosis is not a carry over from the acute coccidiosis for there has been recognised four different varieties of coccidia. Of those, two cause acute coccidiosis and two the chronic type.

Last year, Mr. Fourie, at the North Carolina State College had for his thesis towards his M.S. degree in poultry, the study of intestinal worms in Wake County, N. Carolina. He examined the intestines of more than 2,200 birds, most of which were chickens with a few turkeys, ducks and geese. He has identified eight varieties of tapeworms.

Experiments with Poisons. Ueber die Wirkung verschiedener Gifte auf Vogel. Dr. L. Forchheimer. Pharmakologisches Institut der Univenität Würzburg. Tierärztliche Rundschau, 1931, p. 624.

Description of experiments with cantharidine, arsenic acid, mercury.

Summary.

The data in literature are often difficult to judge. Some give the figures per animal, others according to weight. It is often difficult to ascertain whether the *dosis letalis minima* is meant or a fatal dose. In general it has appeared that toxins act qualitatively in the same manner on birds as on mammals. There are exceptions to this rule, *e.g.*, cocaine, which causes the temperature in birds to fall and in mammals to rise. Quantitatively there are great differences between birds, cold-blooded animals and mammals. The general opinion that birds are very sensitive to poisons appears to be incorrect. This is only true in a few cases, *i.e.*, cyanide and carbon monoxide, alcohol and nicotine.

Birds are less sensitive than mammals to other poisons, *e.g.*, urea, arsenic acid and nerve poisons.

Death Resulting from Disturbed Laying Capacity. Sektionsbefunde bei Legehennen, die an den Folgen gestörter Legetatigkeit gestorben sind. A. Eber. Dtsch. tierärztl. Wschr., 39, 129, 150, (1931).

In 6,175 female birds 1,103 cases of changes in the oviduct or abnormal eggs were found to be the cause of the disease. The lay can be disturbed as a

result of the formation of eggs without shell or by the formation of egg concrements (congealed albumen yolk or fibrin). Both may also occur simultaneously. In the majority of such cases the penetration of bacteria into the oviduct is promoted, with the result that frequently inflammation of the oviduct occurs which spreads to the oviduct and abdominal cavity. In the case of over sized eggs with normal shells, abnormally formed eggs, and eggs which have been too long in the ovary, the hen becomes egg bound with the result that the force of expulsion weakens. This force depends to a great extent on the health and general strength and in consequence on the care and feeding of the hen. Mechanical disturbances and broken eggs in the oviduct can also cause the hen to become egg-bound. The following can also prove fatal : shell-less eggs in the abdominal cavity, concrements, hard-shell eggs or parts thereof. Inflammation of the oviduct caused by inflammation of the intestines or by parasites, may also lead to the hen becoming egg-bound. Outside influences (chasing hens, pushing through narrow fences, squeezing and egg feeling, &c.), can also cause follicle bursts and harm which can result in death. The following might cause formation of shell-less eggs : Shortage of calcium salts, swelling and contraction of the oviduct musculator through parasites, inflammation of the intestines, disturbed calcium resorption, faulty care and feeding of birds (obesity, defectiveness) and exhaustion of the laying organs as a result of intense laying.

Diseases of the Oviduct. Ein Beitrag zur Aetiologie der Eileitererkrankung des Huhnes. G. Schütt. Mieszner-Festschrift, 1931, p. 195. Verlag Schaper, Hannover.

The writer investigated three primary causes of ovary and peritoneum diseases. (1) Unvaried food leads to fattiness which causes hens to become egg bound. (2) Mechanical disturbances sometimes occur in hens with a high production. (3) Disturbances in the laying organs sometimes occur in hens with weak constitutions.

Volvulus of the Oviduct. Un caso di Volvolo dell' Ovidotto nella Gallina. Dott. G. Giusti, R. Istituto superiore agrario, Milano. La Clinica Veterinaria, November, 1931, p. 893.

As a result of volvules of the oviduct the yolks congregated in the abdominal cavity. The twisted portion of the oviduct was œdematous and coloured red. An illustrated description of the oviduct is given.

Severe Cutaneous Emphysema in Chicken. A. K. Gomez, Los Banos, P.I. College of Veterinary Science, University of the Philippines. Journal of the American Veterinary Medical Association, Vol. 79, 1931, p. 553.

Description of a case of severe cutaneous emphysema in a chicken. The ailment developed spontaneously and disappeared within 48 hours, after incision of the skin was made, leading to an uneventful recovery.

Saprophytic and Secondary Micro-Organisms Occurring in the Respiratory Tracts of Domestic Fowls and Chickens in Health and in Disease. C. S. Gibbs. Journal of Bacteriology, 21, 1931, No. 2, pp. 97-109, figs. 4.

In studies conducted at the Massachusetts Experiment Station the microbiological flora of the respiratory tract of domestic fowls and chickens was found

to be varied in health and in disease. It appears that the number and variety of micro-organisms are increased in acute respiratory diseases, and that this increase in microbial flora may be due to the destruction of the ciliated epithelium of the mucous membrane and the increase in secretions and other inflammatory products which are utilised as food by the invader.

While this investigation did not produce sufficient etiological evidence to implicate any of the micro-organisms isolated and studied as the primary cause of infectious tracheitis, nevertheless the findings demonstrated Staphylococcus albus, Streptococcus pyogenes, Pseudomonas æruginosa, and a new spirochete to be important secondary invaders.

Osteo-periostitis. Ostéo-périostite des os longs chez un Poulet. Carpentier Recueil de Médecine vétérinaire de l'Ecole d'Alfort. 1931, Tome cvii, p. 465.

The bones of a cock proved to be two to three times as thick as normally, the joints were normal. The bones were very hard and heavy. The hypertrophia is caused by a layer of bone under the periost. No cause was found.

Hæmangiomata in Fowl. Hamangiom befunde beim Haushuhn. Dr. K. R. Höve and Dr. Silvia von Bornstedt. Institut für Tierhygiene, Landsberg a.d. Warthe. Berliner Tierärztliche Wochenschrift, 1931, p. 517.

Description of six cases of multiple hæmangiomata in the skin of two year old hens.

Histological examinations proved the tumours to be capillar neoblastoms. They form ectasias filled with blood and clothed with entholelium. The septes consist of connective tissue. They appear to be hæmangioma cavernosum.

Iowa Flock Figures Stress Value of Sanitation. Hatchery Tribune, January, 1932.

In approaching the present hatching season, it may be well to keep in mind that a recent Iowa Experiment Station report states, " Iowa poultry flocks made little more than two-thirds as much profit during 1930 as in 1929, if the annual report of calendar record flocks for 1930 is indicative of general conditions.

" The average return above feed cost per hen in 1930 was $2.26, while in 1929 it was $3.10. The average feed cost per hen in 1930 was only $2 as compared to $2.42 in 1929. Lower market prices for poultry and eggs during the year, however, more than offset this lower feed cost. The average egg production per hen in 1930 was 125 as compared to 131·5 in 1929. While these figures would not apply to the average flock, they probably indicate the trend in general conditions."

This report also indicates that the average mortality for these flocks in 1930 was 21 per cent., entirely too high.

The report states, " The investment in the average flock amounted to $741.92, or an investment on a per hen basis of $3.83. The owners of these flocks received $178.93 after feed and all other costs were paid to pay for labour on the flock and interest on the investment. This amounts to a labour and interest return of 93 cents per hen."

These figures both as they pertain to profits and mortality are valuable to hatcherymen. They emphasise the profit possibilities of poultry keeping, and also magnify the importance for added stress on sanitation, both in chick raising and in the care of the adult stock.

Avian Tumours Associated with Retained Yolks in the Oviduct. H. P. Bayon, Molteno Institute for Research in Parasitology, University, Cambridge. The Veterinary Record, 1931, p. 628.

Summary.

Two neoplasms of the oviduct are described ; these appear to have arisen as the result of irritation set up by a retained yolk. One tumour is considered to have originated from the endothelial lining of the oviduct and so showed but a slight degree of anaplasia, though it caused scattered metastasis in the liver and a secondary deposit near the spleen. This did not prove transplantable on nine leghorns tried.

The other was a round-celled sarcoma which was growing rapidly and did not cause metastasis.

The Chinosol Advisor. Der Chinosol Ratgeber. Chinosol Fabrik, Hamburg, Germany.

Description of the composition and the use of chinosol as a disinfectant against poultry disease, recommended by various experts.

Diseases and Parasites of Poultry. J. S. Buckley, H. Bunyea, and E. B. Cram, U.S. Department of Agriculture, Farmers' Bulletin, 1,652, 1931, pp. II + 62, figs. 27.

A revision which supersedes Farmers' Bulletin 1337, previously noted.

Western Duck Sickness Produced Experimentally. E. R. Kalmbach. Science, 72, 1930, No. 1878, pp. 658-660.

This is a report of work carried on by the U. S. D. A. Bureau of Biological Survey in continuation of that by Wetmore previously noted (E. S. R., 39, p. 460), with material gathered for histological, bacteriological, and pathological studies, a preliminary reference to which by Giltner and Couch is noted below. The symptoms of duck sickness were all accurately and repeatedly reproduced by the feeding of the incubated body tissues of birds that had died of duck sickness after the material had been kept at a temperature of 85° F. for five or more days.

Western Duck Sickness and Botulism. L. T. Giltner and J. F. Couch. Science, 72, 1930, No. 1878, p. 660.

This contribution from the U. S. D. A. Bureau of Animal Industry refers briefly to a study made of samples of mud and water collected with the assistance of E. R. Kalmbach, of the Bureau of Biological Survey, during the summer of 1930 from an infected area in Tule Lake, Calif., while the outbreak of duck sickness was at its height, as above noted. Bacteriological examination of the mud disclosed the presence of *Clostridium botulinum*, type C. This type was also cultured from the tissues of wild mallards, pintails, and ring-billed gulls that had died or were killed while afflicted with duck sickness. The clinical picture, coupled with the isolation of botulinum organisms from the mud and the sick birds themselves, suggests that duck sickness is produced by the toxin of *C. botulinum*, type C.

EGGS AND TABLE POULTRY

EGGS

Chemical and Health Value of Eggs. Das Ei, seine chemie und sein gesundheitlicher Wert. W. Weitzel. Bad Dürkheim.

The egg can be divided under the following principal headings : Shell with shell membrane, albumen with chalazæ, yolk with yolk membrane and germ-disc. Of the total weight of the egg the shell usually comprises 10 per cent., the white 60 per cent. and the yolk 30 per cent. The shell consists of 90 per cent. CA CO_3, 0·5—1·39 per cent. Mg CO_3, 0·43 to 0·37 per cent. phosphoric acid and 3·5—6·5 per cent. organic substance of keratin-like character. The shell membrane consists of two layers which run together at the blunt end forming a hollow space which increases after some time and contains a mixture of gases of which 19 per cent. consists of oxygen. The albumen, a liquid, weak yellowish-green, transparent mass, contains, besides water, the nitrogen substance ovoalbumin, mucoid and globulin, mineral parts, traces of fat, chloresterin, lecithin, soap and traces of grape-sugar and the colouring matter liprochrome. The mineral content of the albumen is 0·3—0·8 per cent. of which natron and kali are highest with 30 per cent. and chloride 29 per cent. There are smaller quantities of phosphorus, chalk, magnesia, sulphur, silico-acid, traces of iron and fluorium. Carbonic-acid is well represented. Substances of great value are concentrated in the yolk. The greatest representative of the albuminoid substances is vitellin, a nucleoalbumin with phosphor and iron. The yolk is also very rich in fatty substances of various kinds. Besides neutral fats such as tripalmitin, stearine and oils, mixtures of cholesterin and lipoids, including 10·7 per cent. lecithin, can be extracted.

The yellow colour of the yolk finds its origin in lutein, a lipochrome, which is also found in milk, fatty substances, in the retina, blood serum, exudations and which causes the colour of the beaks and legs of birds. It is closely related to vegetable xantophyll. The content of mineral substances in the yolk is much higher than in the white. In the cinerous substances phosphorus, chalk and kali are predominant with 65 per cent., 13 per cent. and 10 per cent. respectively. The content of ion is also considerable. As regards ferments the following were found : a proteolytic, a lipolytic, a glycolytic and a chromolytic. Secretine, which creates the stomach juices, was also found. The vitamins A, D, and E are well represented in the yolk, with plenty of vitamin B but only traces of C are found. This high content of vitamins give the egg a good antirachitic quality. Moreover an extract can be obtained from egg yolks which, as regards the promotion of growth and its antirachitic qualities, is often better than cod-liver oil and contrary to radiated preparations, is not harmful. The yolk of the egg is also a good remedy against infectious diseases. Bing and Ellermann succeeded in obtaining a phosphatide from the yolk of eggs which increases resistance against tuberculosis. Aron showed the increased resistance of naturally fed children owing to the large content of natural fats in human milk and

recommended the feeding of such nutritives as are found in eggs. The large percentage of nerve substance offers the brain worker a source of phosphor. With its rich store of biological fats and albumen properties, its vitamin and mineral content, the egg is especially adapted for use with rice, gruel and other dishes for invalids. As purine bodies, extractive substances and uric-acid forming materials are unknown in eggs they can be safely given to sufferers from gout. Eggs are better than meat for people suffering with diseases of the kidneys. The occurrence of idiosyncrasy in young children after the consumption of eggs does not take place when only yolks have been given. As eggs belong to the food which causes an excess of acid production in the organism and constipation, they should be eaten with fruit, vegetables, salads, potatoes or milk.

Three Egg Anomalies. Notiz über drei Eianomalien. H. Kommerlöwe, Zoologischer Anzeiger, 1930, No. 95.

The writer describes three cases of double eggs in domestic ducks.

1. In the inside of a large egg a smaller egg was found ; both had shells, which varied however as regards colour and structure. The yolk of the big egg evidently lay close to the shell of the smaller egg ; it could not be ascertained whether the latter had a yolk or not as the owner would not allow the egg to be broken.

2. The situation was somewhat similar as that described above. The small egg appeared to have been pressed into the yolk of the larger egg ; it appeared to be normally formed and also had a yolk.

3. The large and small eggs were connected at longitudinal axis. The formation apparently originated in two yolk centres.

Multiple Yolks in Eggs. Bemerkungen zu H. Krohns Beitrag, Mehrdottrige Eier. H. Kummellöwe. Beiträge zur Fortpflanzungsbiologie der Vögel, 1931.

The writer gives a short review of the problem and discusses the various possibilities connected with the origin of multiple yolk and double eggs.

The usual cause of double yolked eggs is the ripening of two yolks in quick succession which break away simultaneously or shortly after each other. Three types are known : (*a*) the two yolks have a joint membrane ; (*b*) the chalazæ are detached, the two yolks have a joint albumen ; (*c*) each yolk has a separate white. The yolks have a joint membrane and shell.

According to Curtis young hens which begin to lay before the end of the seventh month, have a special inclination for the laying of double yolked eggs . Triple yolk eggs are seldom, but in one case five to eight out of twelve eggs from young hens were found in August, to be triple yolked. Those cases may be deducted in which only one yolk occurs but on which two germ discs are formed. The cause of this may be sought in a premature union of two yolks or in a splitting of the germ cell of one egg.

All the cases mentioned here might result in the formation of twins which, however, usually die before or at hatching. The case is somewhat different with double eggs : (*a*) Double eggs in which the outer egg appears to be quite normal. (1) The enclosed egg is also normal ; (2) The enclosed egg is abnormal. (*b*) The outside egg consists only of a complete system of egg coverings without yolk : (1) The inside egg is normal ; (2) The inside egg is abnormal.

The following may be considered liable to cause the formation of double eggs. After an egg had developed the shell membrane a backward movement takes place. This might cause the egg to fall into the abnormal cavity or that it contains an unusually large quantity of albumen or that it meets its successor.

Second-Grade Eggs and their Causes. Journal of the Department of Agriculture, Dublin, 1931, Vol. 30, No. 2.

The Danish Co-operative Egg Export Association have issued a circular to their members, setting forth the defects most usually met with in second-grade eggs. These are as follows :—

Disease in the hen, *e.g.*, inflammation of the oviduct, &c., may result in second-grade eggs.

Defects in Diet, fish, too much or too inferior offal, turnip leaves, etc., may also produce second-grade eggs.

Hatched Eggs.—Eggs which have lain under hens or in the incubator may be second-grade or even worse.

Old Eggs.—Eggs which have been kept too long are second-grade eggs or worse.

Washed Eggs are second-grade eggs, because eggs are spoilt by being placed in water and rapidly deteriorate.

Dirty, ink-smeared, over-stamped or spotted eggs are also of the second-grade.

Egg collectors can see at a glance whether eggs are dirty or smeared or whether the stamp has been smudged, and often too whether the eggs have been washed or mixed.

The majority of the defects of second-grade eggs can be obviated by the members themselves, provided they exercise sufficient care.

Thick-shelled Eggs.—A good commercial egg should have a sufficiently thick shell, as such an egg is stronger and more durable and weighty. Hens should receive plenty of crushed shell. The outlay on this is amply repaid by the increased value of the eggs.

Stamping.—Members should frequently inspect their stamps and renew them when required. It is very important that stamps should be clear and distinct, a condition which is demanded by the State Inspection Service.

Testing of Eggs.

A new leaflet entitled " The Testing of Eggs for Quality " has been issued by the Ministry of Agriculture and Fisheries as a guide to egg candling operators and for the information of egg producers generally. The leaflet contains twelve illustrations on art paper, showing characteristics and defects in eggs disclosed in the process of candling.

Copies of the leaflet—Marketing Leaflet No. 28—may be obtained, free of charge, on application to the Secretary, Ministry of Agriculture and Fisheries, 10, Whitehall Place, London, S.W.1.

Sales Methods. Wie haben sich die heutigen Absatzmethoden für Eier und Geflügel aus ihren ursprünglichen Formen entwickelt ? H. Kobligk. Fortschr. Landw. 6. Jahrg, 1931. (Ref. Züchtungskunde, December, 1931.)

Individual ideas regarding sales vary greatly. In the case of small farmers and special poultry farms, the primary object is sale. The larger agricultural farmers begin poultry keeping solely with the object of supplying their own needs, and sales are only a side issue. Each farmer has his own ideas of sales methods. The writer believes that collective selling is the most efficient.

Argentina : Regulation of the Importation of Eggs. Journal of the Ministry of Agriculture, London, January, 1932.

In continuance of the policy embodied in an earlier Decree issued by the Provisional Argentine Government regarding the marking of eggs, both

imported and home produced, a further Decree, dated March 31, 1931, has been issued by the Argentine Minister of Agriculture, indicating in detail the requirements laid down in respect of the marking of imported eggs.

All eggs imported into the Argentine must now be stamped with the name of the country of origin (the choice of six languages is given) and with an indication as to whether cold-storage (" refrigerado ") or other means of preservation (" conservado ") have been employed. The inscription must be in letters of not less than 2 mm. in height, marked with a durable ink stamp.

Eggs arriving in the Argentine are to be examined by Government Inspectors, for which purpose the importers, who must be registered by the Department of Agriculture, are to supply information as to the steamship in which the eggs have been consigned, its date of arrival, and other particulars. The eggs must satisfy the following conditions :—

(*a*) The shells must be strong, sound, clean and unwashed ;

(*b*) The white must be translucent and firm ;

(*c*) The yolk must be visible or slightly visible without signs of embryo.

Other regulations relate to the egg cases, which must be of non-odorous wood and must be of a size to hold 30 dozen eggs each. The internal fittings must be new cardboard fillers and cup flats. The cases must bear an inscription showing the species of eggs (*e.g.*, hens' eggs), the country of origin, the name of the shipper and importer, the net and tare weights, and the month and year of packing. It is further decreed that the cold-room of the vessel in which the eggs are transported must be clean, free from meat or other products or substances capable of imparting an unwholesome smell or taste to the eggs. Reference is also made to the method of refrigeration that is considered preferable for the storage chambers in the transporting vessels.

Regulation of the Egg Trade in Belgium. Journal of the Department of Agriculture, Dublin, 1931, Vol. 30, No. 2.

Under an Order of the Belgian Ministry of Agriculture, dated November 13, 1930, hen and duck eggs in shell imported into Belgium must bear a mark showing the country of origin. Without this mark, eggs may not be sold or offered for sale or brought across the frontier, unless with special authorisation. Small lots of less than 100 eggs may, however, be imported without being marked, and eggs imported for the purpose of preserving are also exempt. Applications for such exemption must be made to the Ministry.

A further Order, dated December 3, 1930, provides for the marking of Belgian eggs intended for export with a special mark showing their Belgian origin. The mark consists of a label, obtainable from the Ministry of Agriculture. This label is to be affixed to one end of the egg-case. Exporters, who must be approved by the Ministry, must also affix their own identification number to all cases of eggs exported.

Regulation of the French Egg Trade. Journal of the Department of Agriculture, Dublin, 1931, Vol. 30, No. 2.

Some years ago, the question of regulating the egg trade was under consideration by the French Ministry of Agriculture, but owing to the difficulty of finding a satisfactory definition for the terms : " fresh egg " and " preserved egg," nothing was done and the matter appears to be still under consideration. The practice of the French courts however is to hold that under the designation of " egg," dealers must sell only fresh eggs, *i.e.*, eggs which have not been subjected to any special preserving process and which show no signs of alteration. Special police regulations govern the sale of preserved eggs.

The question of the compulsory marking of imported eggs with the name of their country of origin, as is practised in several countries, is now engaging the attention of the French authorities. Pending legislation on the subject, the Minister for Agriculture has issued a Circular to his officials in

which he points out that a clear distinction between home and foreign eggs can even now be achieved under the Act of August 1, 1905, which empowers the authorities to require that imported eggs shall be sold under some label or description indicating their foreign origin. French eggs, being unmarked, would be instantly recognisable. The Minister points out that enforcement of the existing law will have the advantage of preparing the way for the stricter legislation now contemplated, and he requests his officers to bring to the notice of dealers their obligations under the Act of 1905, and in the event of their disregarding such notice, to furnish a report with a view to the taking of legal proceedings.

Chinese Trade in Eggs and Egg Products. Journal of the Department of Agriculture, Dublin, 1931, Vol. 30, No. 2.

An important export trade in egg products has been developed in China. The egg industry in that country is of but minor interest to the Chinese themselves, and for this reason, they have always neglected it. The result is that poultry-keeping is still run on very primitive lines, and the trade in egg products is largely in the hands of German firms. The products marketed consist of : (*a*) " Whole eggs " (consisting of both yolk and white), and (*b*) Yolks, and (*c*) Whites, separately. All three products are sold both in dry and in liquid form. The egg factories are situated chiefly in the Yangtse Valley, and the principal ports are Hangkow and Shanghai. Northern China also has a considerable output, which is shipped, *via* Tientsin and Tsingtau, mainly to England. Other customers are America, France and Germany.

Besides her trade in egg products, a considerable export trade is done in fresh eggs. In 1928, 612 millions of these eggs were exported from China. One-half of these eggs went to Japan, but the export to Europe is increasing. There can be scarcely any doubt that larger and larger quantities will find a sale in Europe, according as refrigerator facilities are extended.

The Marketing of Eggs. With Special Reference to the Overseas Export Trade. C. F. Anderson. The South Australian Journal of Agriculture, July 15, 1931.

The only market at the present time is England with a possibility of small sales being made to Canada. It is, however, doubtful whether we can profitably compete with foreign countries, especially China (which is a very large exporter of egg pulp) on the London market.

Australia's share of imports of eggs into Great Britain has been as follows : 1927, 1,018,100 dozen ; 1928, 2,225,000 dozen ; 1929, 3,126,270 dozen. It is interesting to note that from 1927 to 1929 Australia's exports of eggs trebled and is still rapidly increasing.

The outlet for exports is in two forms : (*a*) eggs in shell ; (*b*) eggs in pulp. Eggs exported as eggs in the shell are worth practically twice as much as eggs exported in the form of pulp. The normal export season is from early in July until the end of November.

Norfolk Egg Producers, Ltd. Experience of a National Mark Egg-Packing Station. Journal of the Ministry of Agriculture, London, 1931, p. 719.

Description with photos of an egg-packing station of the Norfolk Egg Producers, Ltd., formed in October, 1928.

In the twelve months ended March 31, 1931, 8¾ million eggs were handled. The Society had, in 1930, the largest turnover of eggs of all National Mark egg

packing stations. Three grading machines are in regular use. They are served by two candlers. Two packers are required for each machine to clear the graded eggs and pack them into cases. The three machines working at full pressure can grade about 16,000-17,000 eggs an hour.

Dutch Eggs: New Marking Regulations. Journal of the Department of Agriculture, Dublin, 1931, Vol. 30. No. 2.

Under the Agricultural Exports Act, 1929, the Netherlands Government have promulgated two Orders, the effect of which will be to regulate more strictly the exportation of hen and duck eggs from that country. The Dutch export egg trade has hitherto been organised by private exporting societies, but, in future, the Ministry of Agriculture will exercise considerable supervision over the work and organisation of these societies. Their rules must receive the approval of the Ministry, and any alterations must also be submitted for approval and the Ministry will nominate an advisory representative on the Committee of Management.

According to the provisions of the second Order mentioned, hen and duck eggs intended for export are graded in four classes as follows :—

I. " Fresh Dutch Eggs," which must be of Dutch origin, must not have been cold stored or otherwise preserved, and must show the well-known qualities of the fresh egg on being tested.

II. " Dutch Cold Stored Eggs."

III. " Dutch Preserved Eggs," and

IV. " Eggs," in general, which do not fall under any of the other three grades.

When exported to certain countries specified by the Ministry of Agriculture, eggs of the first three classes must be provided with a stamp showing the country of origin, and also with a stamp indicating the identity of the dealer and producer, but not more than two stamps may be applied to any one egg. The eggs must be sorted by weight and, when sent to the countries specified, the cases in which they are packed must bear an indication of the class, nett weight, and identity of the consignor. The cases too must conform to certain regulations. The rules regarding class IV eggs are simpler. If exported, such eggs must be stamped with the name of the country of origin, and cases must bear an indication that the eggs are of the fourth class.

Under the new Order, egg cases must bear a " week-mark," indicating the week in which the eggs were packed. During the months of March, April, May and June, the words " intended for cold store " may be substituted for the week-mark. Finally, the National Mark, issued under the Act of 1929, which constitutes a proof that the goods in question are in conformity with the regulations, must be applied to egg cases before exportation.

TABLE POULTRY

Swindle with Table Poultry. Leipziger Volkszeitung, May 24, 1931.

During recent times table poultry have been balsamed so that they remained good for months. This is usually done in cases where large numbers have died from infectious diseases. The body is conserved by means of injections of wine with salt and formaline into the veins. This destroys the unpleasant smell, the flesh becomes white and looks better than the flesh of freshly killed poultry.

A meat inspection act ought to be brought into force against such practices.

Dead Poultry Trade: Danish Regulations. Journal of the Department of Agriculture, Dublin, 1931, Vol. 30, No. 2.

In pursuance of the Avian Tuberculosis Law of March 3, 1930, the Danish Ministry of Agriculture have issued regulations governing the slaughter, inspection and branding of Danish poultry and poultry products.

Places where the poultry are killed for sale must be approved by the Ministry of Agriculture. When such approval has been given, the Ministry appoints a veterinary surgeon to inspect all poultry both before and after killing and generally to supervise the whole establishment. Poultry which have passed the veterinary inspection may be branded in red on the back with the official mark : The Danish crown, the word " Danmark " and number of the firm, enclosed in a circle.

Control stations for the inspection of poultry killed elsewhere in Denmark may also be set up, subject to the approval of the Ministry. Only Danish poultry are allowed to be inspected. If passed, they are branded with a red triangular mark showing the crown, the word " Danmark " and the number of the Station.

Without one of these brands, no dead Danish poultry may be exported. A brand is also provided for preserved foods prepared from Danish poultry. It is similar to the brand for dead poultry, as described above, but has no enclosing circle.

French and Irish Turkeys on the London Market. Journal of the Department of Agriculture, Dublin, 1931, Vol. 30, No. 2.

A commission of poultry experts was organised and sent to England by the Paris-Orleans Railway Company, to study the question of why the French turkey has declined so much in price and popularity on the London market. The report of the commission contains some interesting information. In so far as the French trade is concerned, the conclusion arrived at was that if French turkeys are to hold a place on the London market in the future, there will have to be a great improvement both in the conformation of the birds themselves and also in the methods of killing and packing them for market. Furthermore, it is recommended that only first-class firms should be authorised to export turkeys.

The report has many complimentary things to say of the Irish turkey, (which is described as being most sought after by buyers), and of the manner in which it is marketed. " In Ireland," says the report, " Stock birds are selected for their long breasts and powerful muscles. Feeding is planned on rational lines, the dietary in the early stages being rich in nitrogenous matter, and this, in conjunction with selection, has facilitated the production of the excellent specimens marketed. The condition of the birds is generally better than that of the French turkeys, though the latter have finer and whiter skins."

French turkeys often show weakness, especially malformed breast-bones, which are caused partly by the practice of allowing the birds to roost in trees, and partly by a deficiency of lime in the diet. Apart from these accidental defects local breeds in France are not all that could be desired, and the Commission recommended that Irish birds should be purchased in order to improve French flocks.

The manner in which Irish turkeys are packed for market is also the subject of much commendation, and the clean, fresh appearance of the paper with which the cases are lined suggested that the contents, when revealed, might well prove to be either bon-bons or confectionery, and not dead poultry.

Dressed Poultry Competition at Gloucestershire Show. The Journal of the Ministry of Agriculture, London, January, 1931.

At the Annual Exhibition of Produce arranged in connection with the Gloucestershire Root, Fruit and Grain Show, held at Gloucester in November last under the auspices of the Gloucestershire Education Committee, a special class for a market pack of twelve chickens was included in the schedule of competitions. One of the Ministry's marketing officers acted as judge of this class and was much impressed by the quality and appearance of the best entries. Great credit is due to the Education Committee and to the County Poultry Instructor for their interest in the movement towards the better marketing of dressed poultry and for instituting a competition class that will, without doubt, soon become a regular feature at other shows.

It may be of interest to indicate the system of scoring adopted which was found to work well. The points were allotted as follows :—

	Points
(1) Quality—*i.e.*, softness of breast meat	30
(2) Size with compactness	20
(3) Straightness of keel, fineness of bone and absence of surplus fat	20
(4) Fine texture and colour of skin	15
(5) General finish and marketable appearance	15
Total	100

GENERAL

LAYING TESTS, &c.

Annual Report on State Laying Tests 1929/30 *in Germany. Jahresbericht über die Staatlichen Wettlegen des Legejahrs* 1929/1930. Dr. Otto Bartsch. Editor : Fritz Pfenningstorff, Berlin.

The writer has compiled an inclusive report on all German laying tests during the last laying period. Dr. Bartsch has revised this report, not from a point of view of reporting what hens laid the most eggs, but also with a view to arriving at further conclusions from observations of individual laying tests. He treats moulting, broodiness, causes of death, feeding in connection with laying capacity, winter laying capacity, climatic influences and everything that, in his opinion, could be of influence on the results. Especially interesting is his data concerning the performance of individual birds in flocks and in individual breeds, the results of laying tests in general, according to race and breeds, and the weight of eggs in connection with the laying capacity, a problem which is at present claiming much attention. The reports on duck laying tests in East Prussia will be interesting for many readers. These tests have definitely proved, as did a report from England, that at present the laying performance of ducks is in general 30 per cent. higher than that of hens.

Breeds at Laying Trials. Rhode Entries Exceed White Wyandottes and Leghorns. The Feathered World, February 26, 1932.

MADAM,—I enclose an analysis of the entries at the open and county laying trials recognised by the National Poultry Council for 1931-32. Of the former there are eight, and of the latter 28.

The figures for the Monmouthshire County Trials are not included, for as a result of a very severe flood which inundated the trials and caused several losses, the trials were discontinued.

This analysis may be of interest to your readers.

IAN MACDOUGALL,
Secretary, National Poultry Council.

Analysis of Entries at 1931-32 *Open and County Laying Trials Recognised by the National Poultry Council.*

	Open	County	Total
Rhode Island Reds	3,421	2,369	5,790
Wyandottes, White	2,767	2,161	4,928
Leghorns, White	2,351	1,526	3,877
Sussex, Light	649	402	1,051
Leghorns, Black	484	132	616
Rocks, Buff	333	243	576
Anconas	116	62	178
Leghorns, Brown	126	18	144
Welsummers	97	24	121

	Open	County	Total
Barnevelders, D.L. and Part ..	77	22	99
Australorps	46	29	75
Orpingtons White	43	12	55
Orpingtons, Buff	41	6	47
Leghorns, Exchequer	32	13	45
Rocks, Barred	18	17	35
Bresse, White	21	7	28
Leghorns, Buff	14	12	26
Sussex, White	14	11	25
Leghorns, Cuckoo	12	6	18
Minorcas, White	12	—	12
Minorcas, Black	1	8	9
Wyandottes, Columbian	7	—	7
Langshans, Croad	6	—	6
Marsh Daisies	—	6	6
Mensas	—	6	6
Breese, Black	—	5	5
Castellanas, Black	—	5	5
Andalusians	2	—	2
O.E. Pheasant Fowls	2	—	2
Barnevelders, White	1	—	1
Sicilian Buttercups	1	—	1
Cochins, White..	1	—	1
Jersey Black Giants	1	—	1
Redcaps	1	—	1
First Crosses	12	—	12
	10,709	7,102	17,811
Ducks.			
Khaki Campbells	97	—	97
Fawn and White Indian Runners ..	14	—	14
White Indian Runners	14	—	14
Fawn Indian Runners..	7	—	7
Total	10,841	7,102	17,943

Laying Trials Conference, Leicester, January 7th, 1931. The Lancashire Report, April, 1931.

To sum up, the Conference recommends :—

(*a*) Unanimously

1. That eggs shall be graded at all Trials on the scale set out above into Specials, First Grade, Second Grade, and Third Grade (or Underweights).

2. That Second Grade eggs be allowed to count as First Grade up to a maximum of ten Second Grade eggs per bird (not an average of ten eggs per bird for the pen).

(*b*) By a majority vote :

1. That " scoring " be based simply on numbers of eggs.

2. That awards in the case of pens of four or more birds be made on a selection of the best records on the lines of the scheme given above.

Some Problems in the Conduct of Egg-Laying Trials. Ch. Crowther. Harper Adams Utility Poultry Journal, Vol. XV, No. 10.

Summary.

This paper raises for discussion some of the more controversial features of the management of Laying Trials. It is suggested that the difficulties mainly

arise from the competitive lines on which Trials are run, which necessitate the drawing up of an order of merit of the various records registered. Numbers and weights of eggs can be ascertained accurately as matters of fact, but the " scoring " of these records for purposes of awards can only be based upon personal opinions, and hence a great diversity of practice has inevitably arisen. The idea of absolute uniformity throughout. Trials is deprecated, and the opinion expressed that beyond the schemes of grading and scoring the produce uniformity is neither desirable nor feasible.

As the basis of a uniform system of grading the produce, the existing scheme of the National Poultry Council Recognised Trials is commended subject to the adoption of the minimum two ounce standard for First Grade and one and seven-eighths for Second Grade at all stages of the Trials.

As a basis for a uniform system of " scoring " the Ministry of Agriculture scheme used in the County Laying Trials is commended, subject to periodical revision of the scale of " points " and the addition of a corresponding standard scale of money values. It is suggested that a " score " expressed in " points " does not convey as clearly to the average poultryman the real meaning of the performance to which it applies, as does the corresponding money value figures.

The current practice of basing awards in Flock Trials on the total production of the flock entry is criticised, and it is suggested that a more equitable and reliable basis would be secured if awards were based upon a definite section of the flock entry, say upon the best four or the best five in the case of a six-bird flock entry. This would also eliminate the necessity for a specially nominated " reserve bird," but would throw a great deal of work on the clerical staff in the preparation of the Reports. The question of the " reserve bird " is further discussed, and the opinion expressed that under the existing system of basing awards on total production per pen the balance of advantage is in favour of the use of the reserve bird

On the question of Test Averages the opinion is expressed that a standard method of arriving at the average is essential, and that even then comparisons of averages for mixed flocks at different Tests may be very misleading. It is suggested that attention should be directed rather to the averages for individual breeds, taking into account also the numbers of birds included in each case.

Register of Records of Laying Trials, Recognised by the National Poultry Council. Vol. V, 1930-31 Trials.

This is the register of official records made at the 31 officially recognised egg-laying tests run in England. The tests are all run under rules drawn up by the National Poultry Council, and their records are not official unless these rules are accepted. The system has been found to increase uniformity and thus render comparison between different tests possible. Hens eligible for entry in the register are such as have laid (*a*) 200 first-grade eggs ; (*b*) 180 first-grade eggs at a recognised test. The register includes the name of the owner of the bird ; N.P.C. ring No. and Test Letter ; hen's ring number in test ; number of first, second and third-grade eggs laid in first 16 weeks of test ; second 16 weeks of test ; third 16 weeks of test ; and total period (48 weeks) ; date of last egg, or if in lay at end of test ; and number of times broody. It thus forms a very valuable and independent register for reference purposes. The system has done a very great deal to establish the value of official records in England where one rarely hears any records quoted except those made on recognised tests. It should be of especial interest to all members of the Breeders' Register. It can be obtained from the National Poultry Council, Sentinel House, Southampton Row, London, W.C.1, price 3d.

Lancashire International Egg-Laying Test, 1930-31. The Lancashire Utility Poultry Society's Report, October, 1931.

Number of birds competing, 1919. Deaths, 236=12·5 per cent. The average number of eggs laid per bird was 164·88. The National Poultry Council average was 178·28.

Southern Counties Poultry Society's Laying Test at Wood Street, near Guildford, England. 1930-1931.

Total 288 birds. Average production in 48 weeks 190·67 eggs. Mortality 11 per cent. Diseases of egg-laying organs 4·5 per cent.

Egg-Laying Test Government of Northern Ireland. 1928-29. Ministry of Agriculture, Belfast.

The Seventh Egg-Laying Test was held at Stormont, Belfast, from October 16, 1928, to September 16, 1929, a period of 48 weeks.

Total 101 pens, each of six pullets, were accepted. The White Wyandotte proved itself superior to all other breeds as regards winter egg production. The champion pullet laid 263 eggs all of which were first grade. The White Leghorns were affected considerably more than the heavy breeds by the severe weather during the winter. Mortality in this section was very high, death in many cases being due to ovarian trouble. The average number of second grade eggs per Leghorn pullet was 23·6 as compared with 12·0 for each Wyandotte pullet. The average total production was substantially similar for both Leghorns and Wyandottes. being 186·04 for the former and 184·10 for the latter.

The average egg production per pullet was 181·47 eggs as compared with 183·84 for the previous test. The average mortality was 6·4 per cent.

Irish Free-State Egg-Laying Competition, 1929-30.

The eighteenth egg-laying competition conducted by the Department of Agriculture, was held at the Munster Institute, Cork, during the period of 48 weeks, beginning on October 16, 1929, and ending on September 16, 1930.

The average number of eggs per pullet was 171·3. The average number of eggs per pullet for which a record for the full 48 week period was available was 189·7. A total of 85 birds died during the competition, representing 14·4 per cent. as compared with 10 per cent. in the previous one. A number of deaths were due to causes common among birds in high production.

Stud Book of the Official Pedigree Breeding Station at New Longton. Lancashire Utility Poultry Society, 1930.

Introduction.

The formation of a Stud Book, dealing entirely with stock bred under complete official control, is unique, and is only possible for poultry in this country by reason of the Register published by the National Poultry Council of Records in Laying Trials recognised by that Council. The standards of equipment (in its widest sense), and management required by the Council before recognition is given to any test, and the steps which are taken to ensure that they are maintained is a guarantee of the genuineness of the records made at the tests.

It is not too much to say that these tests are the best in the world, not alone for the above reason, but also because of the general excellence of the performance put up by the birds.

The minimum qualification for inclusion in the Register at present is 200 first-grade eggs for White Leghorns, White Wyandottes, Black Leghorns, Light Sussex, Rhode Island Reds, and Anconas ; and 180 first-grade eggs for all other breeds of hens, and 230 2½ oz. eggs for ducks, in 48 weeks. No account is taken of second-grade eggs in estimating a bird's suitability for inclusion.

The opinion of our foremost breeders is that these standards are quite high enough for breeding stock, having regard to the fact that many birds are not in lay when the tests commence, and to the check which occurs when they are moved to the test when on the point of laying.

It is desirable that guaranteed stock from these birds should be available for the improvement of the poultry of this Country and for the benefit of the poultry industry generally, and for the stimulation of the export trade in high-class pedigree birds.

A pedigree based on official records has a much higher commercial value than one based on records made at the breeder's home farm, however well the latter may be conducted.

These considerations led the Lancashire Utility Poultry Society to establish a breeding station in 1929, where stock from birds entered in the Register of the N.P.C. can be hatched entirely under independent control and their parentage officially recorded by means of a Stud Book, which is in effect a Register of Cockerels and Pullets. So that in course of time it will be possible to trace official pedigrees of an increasing number of birds each year.

These pedigrees will be of very considerable value to breeders engaged in the export of stock ; to those who require new blood or blood related to their own strains, and to those engaged in purely commercial poultry farming, who breed their own pullets and need each year numbers of cockerels from good egg production strains.

Their value to those who specialise in the day-old chick trade is obvious The operations of the breeding station will also have a far-reaching effect on the evolution of the utility breeder-layer type of fowl. The breeding station has been recognised and inspected by the N.P.C.

The first volume of the Stud Book contained entries of the stock bred from a limited number of birds representing White Leghorns, White Wyandottes, and Rhode Island Reds only, these being the breeds most highly developed for egg production and most numerously represented in the Registers of the N.P.C.

Canadian National Poultry Record Association. Blue Book, 1931. Ottawa, Canada.

The members of the Canadian National Poultry Record Association present herewith their third annual Blue Book and Breeders' Catalogue.

The purpose of this publication is to unify the forces interested in the breeding of production bred birds, and to disseminate, both at home and abroad, reliable information concerning Registered Poultry as bred by the foremost breeders in Canada.

The organisation constructed to accomplish poultry Registration is unique. It consists of the standardisation of all official Egg Laying Contests conducted by the Federal Government of Canada and then using these Contests as the basis for poultry Registration work, the registering of all birds which qualify, the breeding of registered birds under a system of Government inspection and the following up of this work with a registration progeny test. This undertaking is known as Canada's National Poultry Registration Programme and constitutes one of the most advanced national breeding policies ever undertaken by any country.

The Canadian National Poultry Record Association was formed in 1923 by the amalgamation of the breeders of production bred poultry. We offer no apology for the accomplishments of the association during its period of service, or for the businesslike methods employed by its members. While the

primary object in the foundation of the association was the registration of poultry, it has been a direct medium to assist as well as to encourage and protect the poultrymen who place honour above monetary return.

The breeders advertising in this publication are members of the Canadian National Poultry Record Association. Their past record as reliable poultrymen entitles them to this membership and also to this advertising privilege. They respectfully solicit a share of your patronage. To make poultry keeping a bigger, better and more honourable business is their foremost desire.

Believing that Canadian-bred birds are worthy of national advertising we take considerable pleasure in presenting to the poultry fraternity this, our third annual publication.

The Canadian Record of Performance for Pure-Bred Poultry. Record Year 1929-30. Regulations, Standards and Records of Fowls Qualified for Certificates. Report No. 11. Ottawa, Department of Agriculture, 1931.

During the year 1929-30, Record of Performance continued to furnish the great bulk of tested, certified breeding stock by means of which the standard and productive qualities of the flocks of the country are being improved.

Since its inception in 1919, a total of 224,808 birds have been entered, inspected and trapnested under Record of Performance. Of this number, 79,476 birds have qualified for official certificates, covering standard qualities as well as production, egg weight, &c.

During the present time of low prices for farm produce, it is doubly important that every unit of production be of the utmost efficiency. The more eggs per ton of food that fowls can be made to produce, the more profit to the owner. This result can be obtained through increased production per bird and the basis of this lies in the breeding behind the birds.

The place of Record of Performance in the testing of breeding stock on a large scale has long been recognised, and Record of Performance breeders have supplied a great deal of stock to the general farm flocks of the country.

Many R.O.P. cockerels are used to head flocks supplying eggs to hatcheries approved under the Hatchery Approval Policy. It is the intention of the Department that the use of these males in this way be encouraged as it provides for the distribution of the high producing blood lines established under R.O.P. to the general farm flocks in a great volume. The fact that entries in Hatchery Approval have more than doubled in the past year and that more R.O.P. males were used to head the hatchery flocks, points to a large demand for R.O.P. males in the future.

Results for 1929-30.

Probably the outstanding incident in the past year in connection with Record of Performance was the impression made by the R.O.P. birds shown in the Canadian Educational Exhibit at the Fourth World's Poultry Congress, held in London, in July, 1930. The 50 birds on display were shown in six cages, which rose out of the panoramic scene of Canada. Suitable lighting effects showed the birds to advantage, and they were easily the outstanding feature of the exhibit. At the close of the Congress there was keen bidding for the birds, and all were quickly sold at very satisfactory prices. Other good export sales of R.O.P. stock were reported during the year by breeders in Canada.

Further consolidation of the R.O.P. work was made possible during the year through the taking over by the Department of the sole administration of the Cockerel Approval Policy. This had heretofore been operated in conjunction with the various R.O.P. Breeders' Associations. The work was taken over by the Department with the full consent of the Associations, which are thus left free to devote their whole energies to promoting sales of R.O.P. stock.

A table gives the entries in R.O.P. classified by breeds in each province.

Entries for record year 1929-30, total 254 breeders, 30,385 birds.

First Summary of Breeder's Results under Canadian Record of Performance for the Year 1930-1931. R. W. Zavitz, Supervisor, R.O.P. for Poultry, Ottawa, January 13, 1932.

This summary gives the results of breeders who had completed their records by January 13.

Under the heading " Certified " are given, separately, the number of birds which qualified for Advanced R.O.P. Certificates (225 eggs and over) and the regular R.O.P. Certificates (150 to 224 eggs). Under the heading " Withdrawn " are given the birds which were voluntarily withdrawn from the test by their owners prior to June 1st. Under the heading " Failed " are included birds which did not lay at least 150 eggs, or whose eggs were under 2 oz. in average weight. Under the column " Light " it is noted whether or not artificial lights were used on the birds during the test. In the last column is given the production of the highest certified bird in each flock.

Ninth International Egg-Laying Contest. Final Report of Michigan International Egg Laying Contest. Poultry Project Bulletin, Department of Poultry Husbandry, Michigan State College, East Lansing, Michigan, September 30, 1931.

With the closing of the Ninth Contest on the evening of September 22, those individuals which had passed or had prospects of reaching the 300 egg or point mark were retained to complete their year under our supervision. These official trapnest records are arranged in descending order of points scored and eggs laid.

Production Summary of Ninth Contest.

Breed	No of Birds	Average Eggs	Average Points
Barred Rocks	170	155·9	152·4
White Rocks	40	142·9	138·7
White Wyandottes ..	10	195·3	201·4
Single Comb Rhode Island Reds	60	186·8	193·2
Leghorns	720	206·0	207·5
All Breeds	1,000	193·7	194·5

Seventh Alabama National Egg-Laying Demonstration. Alabama Polytechnic Institute, Auburn, Alabama.

The demonstration consists of 100 entries of 13 birds each. Two entries or 26 birds are placed in each house. Performance is measured by number and weight of eggs produced.

The contest closed September 22, 1931, giving an average of 198·6 eggs per bird for the 51 week period. Fourteen possible 300 eggers or pointers were held over and trapped the full 365 days. Seven of these qualified for this high honour in either points, eggs, or both.

YEAR BOOKS

Calendar for Poultry-Husbandry for 1932. *Kalender für Geflügelwirtschaft* 1932. R. Römer and A. Reimer. Verlag Fachner and Fischer, Leipzig, W.33.

This edition is not an ordinary year book but a tear-off calendar with 106 pages and 117 photographs. In each week and each Sunday a large page. The front of the page gives the day of the week at a glance and a photograph with description of remarkable events in connection with poultry. The back of the page contains advice in regard to poultry according to the time of the year, descriptions of interesting experiments, &c.

The object of this calendar is to give the poultry keeper advice in another way than by means of books, periodicals or lectures.

The World's Poultry Science Association is well represented in this calendar. On page 59, Sunday, July 17, is an interesting photograph of Sir Edward Brown, taken by Mr. R. Römer, in Canada on July 17, 1927, when Sir Edward was made Chief of the Blackfeet Indians.

Page 61, Sunday, July 24, shows photographs of Members of Council of the W.P.S.A., T. Elford, Professor J. Rice, Professor Lewis, President Kock, Dr. te Hennepe, Professor Castello and Dr. Weinmiller.

A description of the organisations of the W.P.S.A. and International Review takes up the entire back of the page.

Calendar for Poultry Breeders for the year 1932. *Kalender für Geflügelzüchter für das jahr* 1932. Published by Fritz Pfenningstorff in co-operation with well known breeders. 800 pages with 150 illustrations and 2 coloured plates. Price R.M.1. (post free R.M.1,30). Fritz Pfenningstorff, Steinmetzstrasse 2, Berlin W.57.

Published already for more than 30 years the well-known friend and advisor of all poultry breeders, once again appears in the 1932 edition and offers, besides the space for daily notices regarding book-keeping, hatching and egg tables, numerous interesting and useful data.

What makes the calendar especially useful and gives it in a prominent manner the character of a real year book, is the inclusion of publications by the State Institutions for Poultry Breeding regarding the results of experiments which they carried out during last year, results which are of the greatest significance for the practical poultry breeder. Further the calendar gives the results of work done in connection with Feeding methods and Feeding Tables by Professor Dr. Lehmann, one of our most noted authorities on these subjects.

The rich and varied contents of the calendar make it difficult to choose extracts therefrom. We must however, draw attention to the month indicator, the advice regarding artificial incubation, self made practical implements, goose breeding and keeping, the poultry apothecary. When we add that the following have also contributed, this will be sufficient: Römer-Cröllwitz, Dr. Weinmiller-Erding, Dr. Frangauf-Steenbek, Prof. Dr. Mangold-Berlin, Dr. Schifferer-Koblenz, Dr. Taut-Berlin and others.

A novelty in this edition is the inclusion of facts connected with goat-breeding, bee-keeping, rabbit-breeding, breeding of fur-bearing animals, fruit-growing, mushroom growing, &c., all from the pens of expert writers.

The Feathered World Year Book for 1932. Edited by Miss O. Comyns Lewer and A. P. Thompson. 9, Arundel Street, London, W.C.2.

Any reader who wishes to acquaint himself with the position of the poultry industry in Britain, and with the type of poultry and pigeon breeds kept there

should send 60 cents (2s. 6d.) for a copy of " The Feathered World " Year Book for 1932, obtainable from " The Feathered World," 9, Arundel Street, London, England. This book—now in its twenty-first year—contains over 640 pages and 250 photos. It gives a photo and description of nearly every English poultry and pigeon breed, and also provides the names and addresses of leading breeders in each variety and articles on the latest methods now employed in England.

Year Book and Register of the National Utility Poultry Society, 1932. 35th Year. 53, Victoria Street, Westminster, S.W.1, London.

Contents.

Foreword by J. Raine, Chairman. Rules. Annual Report, 1930-31. The Society and its Branches. Affiliated Societies, Members' Privileges, Marking of preserved Eggs, Egg grading Regulations. The National egg-laying tests. National laying test, 1930-1. Mineral Salts in feeding stuffs. Analysis Tables of Foodstuffs. Standard for Judging Table Poultry, Ducks, Geese and Turkeys.

Articles.

The Fifth World's Poultry Congress, Rome, 1933, by Dr. te Hennepe. Chicken Dinners " on Tap," by J. C. Hormel. Agricultural Marketing Act, 1931. Young Farmers Clubs. The Future, by T. R. Robinson. The Importance and Expansion of Poultry Keeping in Kent, by W. R. Snell. How to Make Poultry Pay, by Prof. J. L. Rosedale. Notes on Conditioning Table Poultry, by E. A. King. The General Farmer and his Fowls, by Ch. E. B. Philcox. Poultry Keeping in Town, by S. E. Gregory. The Register of Breeds.

Lancashire Utility Poultry Society's Report. July, 1930. Preston, England.

Contents.

Introduction. Leaders of the Lancashire Poultry Industry.—Brief Biography and Portraits. Editorial. The Progress and Influence of the Lancashire Poultry Industry, by Tom Barron. How the Lancashire Federation was Formed, by E. Collier. Outline of the Lancashire Official Breeding Scheme. Photographs of the Leading Pens in the Society's Current Laying Test—First to Ninth Month. Laying Test Reform, by Dr. J. E. Helm. Wingbanding, Hatchability, and Rearability Records, by James Sutton. A Review of the Changes we have seen, by Jack Wrennall. Utility Shows.—Breed Types and Eggs, by Wm. Hamnett. The Management of a Large Poultry Farm, by J. Collinson. Slatted Floors.—First Impressions and Experiences, by Wm. Gardner. Safeguarding for the Poultry Farmer. Notes from the Diary of a Commercial Poultry Farmer. International Egg-Laying Test.—Ninth Month's Report.

Poultry Experiment Station, Netherlands—India. Verslag van het Gouvernements Proefstation voor Pluimveeteelt over 1930. W. T. Gerhardt. Nederlandsch-Indische Bladen voor Diergeneeskunde, 1931, p. 377.

Description of the poultry experiment station at Buitenzorg. A few white ducks occurred among the runners brought at Tjomal and Tondjong. Three of these were shown at the World's Poultry Exhibition in London as specimens of the real Indian Runners. The native Netherlands Indies sawah duck is the original species of duck breeds found in Europe and America.

White Leghorns, Rhode Island Reds and Barnevelders have been imported from the Netherlands. Various diseases occurring in these breeds are described.

In most cases complaints of the ovary and oviduct were the cause of death. Intestinal parasites and leucæmia also occurred.

The laying figures for hens imported from Holland are interesting. The first laying period is connected with the date of birth. Afterwards there follows a moulting period in April and May and then, independent of the age, another period of intenser laying in July and August. The lower laying period during the first years, fell simultaneously with the change from the wet to the dry mousson.

Of the young hens born in the Indies, the White Leghorns and Rhode Island Reds averaged 150 eggs in their first laying year but the average weight of the eggs was low (48·7 grams). The average production of the Barnevelders was 120, that of Wyandottes 111 and of Brown Leghorns 137.

EXTENSION

The World's Poultry Congress. The Final Report.—A Valuable Book of Reference. The Feathered World, May 22, 1931.

The publication this week of a Final Report of the Fourth World's Poultry Congress marks the end of an outstanding event in the poultry world. Possibly no other form of husbandry could have presented such an impressive example of friendly co-operation between the countries of the world as was displayed at this Congress. That some sixty countries should have exerted themselves to take part, when in many cases their participation involved sending delegates and exhibits several thousand miles, is proof not only of the universal importance placed upon the further development of the poultry industry, but also of a desire to pool knowledge and experience for the benefit of all, irrespective of race and nationality.

As a result of this Congress, the poultry industry in many countries was given a definite stimulus, gaining both in prestige and in public appreciation. The work of education and research which has been carried on patiently and consistently for many years, and which has played so important a part in the development of the industry, attracted a new interest from those whom this work is intended to serve. The Congress afforded a valuable comparison between the methods adopted by different countries in order to increase production, whether with a view to becoming self-supporting to a greater extent or to developing export trade.

Commercial Results.

The immediate commercial results of the Congress have been quite definite in form, for not only live stock exhibitors but manufacturers of poultry appliances and accessories have expressed surprise and gratification at the amount of new business which has been obtained since the Congress. So far as Britain is concerned, evidence of an increasing demand from overseas for British stock poultry continues to accumulate.

The Exhibition.

The national exhibits, the live stock and the trade stands constituted the largest poultry exhibition ever known in this or any other country. National exhibits were staged by 24 nations. These exhibits presented in spectacular form the recent work of scientific research, the progress and result of educational schemes, the advance achieved in marketing methods, and some of the main features—artistic, scenic and economic—of the countries concerned. A cinema theatre provided a constant daily programme of films from different countries. The live stock exhibit contained some 7,000 head of fowls, ducks, geese, turkeys, pigeons and rabbits bred in seventeen different countries. One had never before had such an opportunity of comparing specimens of the best stock each country produced. In the trade section 117 exhibits were presented by nine countries.

Scope of the Final Report.

The volume includes 159 original papers, dealing with all aspects of the poultry industry. The papers were submitted to the Congress by leading authorities on their subjects throughout the world, and, with the account of the discussions that ensued, will form a valuable source of reliable information for all connected with the industry for many years to come.

Under the head of " Breeding and Incubation," for instance, readers will find papers by Prof. R. C. Punnett on " Some Experiments Concerning Fecundity " ; by Mr. Tom Barron, on " The Lancashire Breeding Scheme," and by Dr. A. Morley Jull (United States) on " The Inheritance of Hatchability."

In the section devoted to nutrition and rearing Mr. Tom Newman contributes a paper on " Some Experiments in Poultry Feeding " ; Dr. J. B. Orr, in collaboration with Mr. A. Macdonald, deals with " Recent Research in Poultry Nutrition " ; Mr. E. T. Halman contributes a paper on " The Rôle of Fibre in Poultry Feeding," and Messrs. Heuser and Norris (Cornell University) deal with " The Influence of the Protein Level on the Rate of Growth in Chickens."

In the disease section every paper contains information of vital interest and importance to the poultry industry. Dr. Leo F. Rettger (Yale University) reports on " The Present Status of Bacillary White Diarrhœa Control in the United States," and there are also papers on this disease by Dr. Miessner (Hanover), by Mr. T. Dalling and Messrs. Card and Roberts (Illinois University). " Fowl Pox " is dealt with by Mr. T. M. Doyle, of the Ministry's Veterinary Laboratory.

There are papers on " Co-operative Marketing in Canada," by Messrs. Landreth and Waldron ; on " The Marketing of National Mark Poultry Products in England," by Mr. A. W. Street ; on " Irish Free State Eggs," by Mr. H. W. Stevens, and on " Marketing in South Africa," by Mr. C. H. Spamer.

In the " Education and General " section there are some thirty-three papers dealing mainly with the measures taken in various countries for instruction in poultry husbandry and stimulating development by educational schemes. There are also papers on such subjects as " Poultry Rearing in France," by M. G. Legendre ; " Management and Nutrition Problems in Battery Brooding," by H. A. Bittenbender (Iowa, U.S.A.), and " The Origin and History of the Indian Runner Duck," by Miss M. Chisholm.

The rabbit section of the volume reports discussions on a series of papers dealing with the organisation of the rabbit industry and various aspects of rabbit culture, including a valuable paper on " Rabbit Diseases," by Mr. H. Gray, of London, England.

In addition to a complete report of the Congress proceedings, the volume contains an interesting foreword by Mr. Percy A. Francis, the Poultry Commissioner of the Ministry of Agriculture in England, who acted as Congress Director, and a complete list of Congress members. To increase the usefulness of the Report as a reference work on poultry matters a full subject index has been added.

The World's Poultry Congress Report. National Poultry Journal, July 10, 1931.

I have been through this volume most carefully and I have come to the conclusion that a very radical alteration is necessary in the preparation of papers if the World's Poultry Congress is to be of use in the matter of instruction and education to the poultryman in the field. The Congress is organised by the World's Poultry Science Association and a vast number of the papers compel me to say that they have been prepared by scientists for scientists, without the least consideration for the poultry worker whose participation in Congress made Congress possible. The discussion that followed the presentation of each paper was confined almost entirely to the scientists, clear

evidence, if further evidence than the papers themselves were needed, that most of those who prepared papers had failed in their chief object—to instruct and advise—for are not poultry-keepers in the main the most enquiring and open-minded of all the different classes of agriculturists. What can the average poultry keeper make of Professor Parkhurst's advice on cod-liver oil :—

" The poultry keeper can be assured of a high quality in a cod-liver oil if he purchases one with the following specifications :—

" Vitamin D—at least 60 rat units of antirachitic activity per gram (British Standards).

" Vitamin A—should be eight or more Lovibond blue colour units.

" Free Fatty Acid (as oleic acid)—not over 1·5.

" Unsaponifiable matter—not over 1·5 per cent.

" Iodine value—155 to 173.

" Specific gravity—0·920 to 0·930.

" Saponification value—179 to 192.

" Refractive index at 40°—1·4704 to 1·4745.

" Taste—fishlike, not bitter.

" Odour—slight, fishlike, but not rancid."

Doubtless the corn merchant will see that the professor gets what he requires, especially if he tells about the refractive index at 40° !

Who can imagine a more interesting title for a paper than " Time of Occurrence and Probable Causes of Mortality in Chick Embryos." This, it would appear, is likely to shed a new light on a problem of interest and concern to practically every poultry keeper. There follows a paper that cannot be understood by one poultry keeper in ten thousand. What is the use of firing words like monomicrophthalmia, hypperncephalymicrophthalmeaccopia (usually) at a poor innocent poultry keeper. He will say that an embryo suffering from a name like that is better dead, and a few of the most sarcastic might make a similar reference to the users of such words. (Usually.)

Let it not be thought that all the papers are of this type. Far too many of them are and the leavening of really useful and understandable papers does not remove the impression that the Congress was arranged by and for scientists and highbrows. The whole question of science and practice is the subject of a paper by Dr. A. L. Hagedoorn, the Secretary of the Netherlands Genetic Association. He makes a plea for greater co-operation between scientist and practical breeder, and he points out several ways in which this might be done, but even he fails to realise that scientific teachings can never be fully utilised until the scientist takes the trouble to make himself understood.

The volume contains 157 papers in full, together with the discussions following. Thirty papers are devoted to breeding and incubation, 25 to nutrition and rearing, 32 to diseases and their control, 31 to economics (including marketing), 33 to education and general, and 9 to rabbits. Rabbits, of course, have nothing whatever to do with poultry, and it is difficult to understand why they should be included in a world poultry congress. Of the other papers I find those dealing with the more practical problems of most interest. Professor Punnet tells how Cambars were made. The Northern Breeding Station sends a paper on the effects of inbreeding. Mr. Tom Barron tells of the Lancashire Breeding Station scheme, and Mr. Tom Newman writes of the experimental results obtained at the S.P.B.A. farm. Many of the papers from overseas provide really new information, but what is the exact significance of the discovery of " The Life Duration of Cock Spermatozoa Outside the Body,' 'and what class of poultry keepers is it that is going to concern itself over " A disease in Whistling Swans."

If another congress is to be held I suggest that there is need for greater supervision over the type of papers to be read. One fully appreciates that many difficulties arise when contributions from so many countries have to be accepted, but one can expect that the papers submitted shall be understandable. Most English contributors are no better in this respect than those abroad, over whom control cannot be exercised. Mr. Tom Newman, the chairman of the Papers and Sessions Committee, appears to have been fully impressed by the degrees

and honours held by his committeemen. Anyhow, I cannot congratulate him on his choice of papers. He has given us far too much technical and highly scientific matter, suited to scientists and academicians rather than his fellow poultrymen.

J. A. W.

Poultry Breeding in Palestine. Eier-Börse, January 21, 1932.

The following is an extract from " Palestine and near East " :—

It is only since the last five years that poultry breeding has been developed on modern lines in Palestine, (chiefly in the Jewish Colony). According to statistics published by the " Tnuvah " Market Organisation, the increase in the sale of eggs has been remarkable : 1927—70,000 ; 1928—356,000 ; 1929—887,000 ; 1930—1,651,000 ; 1931—3,300,000. According to the census in 1927 there were 192,123 head of poultry in the Jewish Colony of which 118,124 were young poultry. The census for 1930 in the Agricultural settlements which have been founded by the Zionist Executive, showed 162,838 head of poultry, which is an increase of 80 per cent. as compared with 1927. The total number of poultry in the country in 1930, according to official statistics, was estimated at 1,162,000, which is, however, 500,000 below what it really should be. The development of the poultry industry resulted in the import of incubators in the period 1922-1929 of a value 7,000 L.P. to which must be added some incubators, which were made in the country. It must, however, be remembered that there is still a large import of eggs, chiefly from Egypt and Syria. In the years 1926-1927 the import amounted to 15,000,000 eggs. This fell to 6,500,000 in 1928, and rose to 11,300,000 in 1929 owing to an epidemic among the poultry in the country. The number of eggs imported in 1930 was 7,700,000.

Possibilities of the Poultry Industry. C. F. Anderson, Government Poultry Expert. South Australian Journal, February 16, 1931

The production of poultry and eggs is, at the present time, showing rapid expansion. For a number of years persons engaged in this form of production were rather scorned at, but during the last ten years the poultry industry has gradually forged its way to the front, until to-day it is an industry that lends itself particularly to great expansion, especially in view of the present values of wheat and its by-products.

When it is understood that the Australian, and particularly the South Australian, White Leghorn is pre-eminent in the world as an egg-producer, it can readily be seen what a wonderful asset the fowl is to South Australia, and the opportunity it offers for future expansion. Our somewhat despised White Leghorn hen of an average weight of 4 lbs. produces on the average 14 dozen eggs a year, equivalent in weight of 21 lbs., or, in other words, she produces five times her own weight in eggs.

In stressing the possibilities of the poultry industry, figures supplied by the Government Statistician for the year ending June, 1930, show that the value of the industry to South Australia on present-day values is £950,542, and the total numbers of poultry, ducks, geese, and turkeys existent in the State as on June 30, 1930, were as follows :—

Fowls	1,552,760
Ducks	50,102
Geese	16,555
Turkeys	46,401
or, a total of	1,665,818 head.

These figures offer more room for thought in the direction of the food consumed, and which is produced in our own State. It can be taken as a

reasonable basis that each head of poultry, ducks, geese, turkeys, &c., consume 4 ozs. of wheat per day per bird—whether in the form of wheat, or its by-products of bran and pollard—equivalent to approximately 2,500,000 bush. of wheat per year.

In support of this conclusion, I draw attention to the rapid growth of the exports of eggs overseas. Any advancement in our primary industries is usually judged by our exports, and in this direction the poultry industry compares more than favourably with any other line of primary production. Five years ago the exports of eggs from Australia were practically negligible. For the past season, concluded in December of last year, nearly 200,000 cases of eggs—each containing 30 dozen —were shipped from Australia. South Australia's share of this total was 25,000 cases, which was just double the quantity of eggs shipped in the previous year—which was then a record year. In other words, our previous record exports were doubled in one season. If our other primary industries had made similar advancement to that made by the poultry industry during recent years, we would not find ourselves in our present unfortunate position. The 25,000 cases of eggs exported from South Australia during the season just concluded were valued at £50,000, and the total exports of eggs from Australia for the similar period were valued at £430,000.

In addition to the overseas exports, South Australia is a large exporter of both eggs in the shell and egg pulp to the eastern States, the value of which is estimated at £150,000 per year.

With regard to the production of poultry and eggs, either as a side line or solely as a means of livelihood, South Australia is fortunately situated. We have one of the finest climates in the world, both for the rearing and production of poultry ; our utility strains of poultry are unequalled in any country ; we have all the necessary foodstuffs practically at our door ; it is not necessary for one penny to go out of the State either for plant, equipment, stock, or food, and above all other considerations, we have a payable export Empire trade for all the eggs we are likely to produce in this country for generations to follow.

Demonstration Poultry Croft at Kirkapol, Tiree. T Alexander and J. Kirkwood. The Scottish Journal of Agriculture, October, 1931.

The West of Scotland Agricultural College, with a view to demonstrating the economic value of poultry in the island of Tiree, made arrangements in 1915 for the establishment of a demonstration poultry centre at Kirkapol.

In this article the methods of feeding and management and the results obtained during the two years 1928-29 and 1929-30 are set forth.

The island of Tiree, on the open Atlantic, is exposed on all sides and often experiences wild and stormy weather. There are no hedges or trees on the island. The breed kept at Kirkapol is Rhode Island Reds. This breed has proved to be well suited to conditions obtaining there. It withstands the cold winds and suits the light sandy soil.

Follows: Description of Feeding of Fowls, Feeding of Chickens, Financial Results.

For the year 1929-30 the average number of eggs produced per pullet was 176 and for the second year hens 115. It does not necessarily follow that pullets are more profitable than second year birds, because it is from the latter that hatching eggs are sold.

Conclusions.

On the exposed island of Tiree a small flock of about 40 head of a good laying strain, fed and managed on up-to-date lines left a handsome profit to the owner.

Our Problems—What are They? New England Poultrymen, June 15, 1931.

An analytical study of the poultry industry of Massachusetts shows that its principal problems are :—

1. The control of infectious diseases in order that mortality may be lessened, epidemics avoided, and uncertainty removed from the business.

2. Stock bred for vigor, good Standard quality, and high production, so that it will live, be readily saleable, and produce eggs efficiently, thus lowering production costs.

3. Better business organisation of poultry plants with regard to labour economy and effective use of equipment.

4. Improvement in marketing practices and quality of products, in order to increase the demand and to hold markets against increasing competition.

The Poultrymen's Challenge—Raise Healthy Pullets. New Jersey Agriculture, May, 1931. Extension Bulletin 83.

Leslie M. Black, the author of this bulletin, after pointing out that disease is a great profit destroyer on many New Jersey poultry farms, proceeds to discuss means for eliminating it. His bulletin contains some interesting tables which show the influence of certain sanitary practices in reducing disease in various countries.

Decennial Live Stock Census in Holland. Journal of the Department of Agriculture, Dublin, 1931, Vol. 30, No. 2.

A census of live stock is taken every ten years in the Netherlands. Returns were collected in 1930 between the dates May 20th and June 20th, and the final results have just been made public. The following table shows the totals for 1930 as compared with those returned on the two previous occasions, 1921 and 1910 :—

	1930	1921	1910
Horses	299,152	363,668	327,377
Cattle	2,366,066	2,062,771	2,026,943
Sheep	484,987	668,211	889,036
Goats	131,252	272,298	224,231
Pigs	2,917,781	1,519,245	1,259,844
Fowl	24,637,204	9,660,799	9,777,962
Ducks	662,161	——	——
Beehives	86,326	93,637	69,406

The most remarkable increases are in the case of pigs, which have increased by half a million since the last census, and fowl, which number 24½ million as compared to 9½ million in 1921.

REPORTS OF THE CONGRESS OF 1927 AVAILABLE IN FRENCH

For those who have not been able to secure a copy of the Report of the 1927 Congress because of the supply being exhausted, it will be of interest to know that there are a few available at present, only in French, and as long as they last can be procured at $5.00 a copy.

P. C. ELFORD, *Past President.*

REPORTS OF THE CONGRESS OF 1921 IN SCHEVENINGEN AVAILABLE IN ENGLISH AND FRENCH

These reports can be procured at $4.00 a copy, as long as they last.

DR. B. J. C. TE HENNEPE
ROTTERDAM

ADVERTISEMENTS
IN THE
INTERNATIONAL REVIEW OF POULTRY SCIENCE

GO ALL OVER THE WORLD