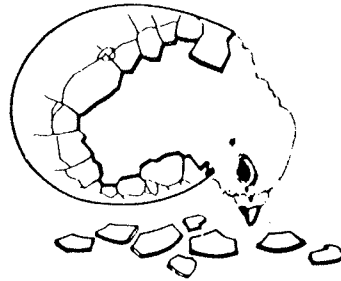


NEWSLETTER 24



APRIL 1986

## Australian Veterinary Poultry Association

**President :** Hugh Bray, Department of Agriculture, GPO Box 1671, Adelaide, SA  
[08] 227 9911

**Secretary-Treasurer :** Garry Cross, Central Veterinary Laboratory, Roy Watts Road,  
Glenfield NSW 2167 [02] 605 1511

### SUSTAINING MEMBERS OF THE AVPA

Sustaining Members contribute funds which help defray running costs of the AVPA.

Support is given in annual units of \$50.

The Association thanks these firms for their active interest and support.

A.A.Tegel Pty. Ltd.	1 unit
Allied Mills Rural	1 unit
Arthur Webster Pty. Ltd.	5 units
Bartters Enterprises	1 unit
Cyanamid [Australia] Pty. Ltd.	4 units
E.R. Squibb and Sons Pty. Ltd.	1 unit
Fielder Gillespie Davis Ltd. - Agricultural Division	1 unit
Golden Poultry Farming Industries Limited	1 unit
Hyline Chicks Pty. Ltd.	1 unit
Inghams Enterprises Pty. Ltd.	1 unit
Intervet (Australia) Pty. Ltd.	1 unit
Manos Poultry Industries	2 units
Pfizer Agricare Pty. Ltd.	1 unit
Roche Products Pty. Ltd.	1 unit
Smith Kline & French Labs. [Australia] Ltd.	1 unit
Steggles Pty. Ltd.	2 units
Table Talk Poultry Farms Pty. Ltd.	2 units
Upjohn [Australia] Pty. Ltd.	1 unit

## TWO AVIAN QUARANTINE FACILITIES RECOMMENDED

In May 1985, Dr Bill Snowden, Chief of AAHL at Geelong, was commissioned by the Minister for Primary Industry, Mr Kerin, to advise him on the type and size of facility required to allow the safe import of avian genetic material. The Minister said in a statement released on 10 February that Dr Snowden has recommended construction of two facilities.

"In his report, Dr Snowden has supported the construction of the egg hatching facility, as proposed by the working party of the Chief Quarantine Officers, but has also identified a need for new genetic material for breeds of birds that cannot be reared in isolation from their dams." said the Minister.

Subject to funding, construction of the egg hatching facility is planned to begin during 1986-87 at the Torrens Island Animal Quarantine Station, Adelaide. The recommendation for a second facility for live birds would need further examination by the officers of AAHQS, according to Mr Kerin.

Copies of the report are available from AAHQS: contact Dr Kevin Dunn (062) 71 6473 or Lin Enright (062) 72 6661. [The crow call, AAHQS, is a new Canberra acronym for the old Bureau of Animal Health after it swallowed Animal Quarantine.]

### New coccidiosis vaccine promising

In a press release, the USDA has announced encouraging test results from a genetically engineered antigen that could be useful in developing a vaccine against coccidiosis in chickens. The USDA claimed that this new antigen confers the first protection ever obtained against coccidiosis by any method other than actual infection.

The antigen was engineered by Russell McCandliss and colleagues at Genex Corporation using antibodies produced by the Agricultural Research Service of the USDA.

## 3 Reviews

The World's Poultry Science Journal 1985 41 published three brief but informative reviews:

Ameenuddin S *et alia* Vitamin D<sub>3</sub> and its metabolites in poultry nutrition. p 52

Schleifer JH The efficacy and mechanism of competitive exclusion for the control of salmonella in poultry. p 72

Williams NS Stress and the behaviour of domestic fowl. p 215

## THE HUNT FOR IMMUNE MODIFIERS

Freund's complete adjuvant is a uniquely powerful adjuvant but its clinical application in vaccines has always been precluded by unacceptable toxicity attributable to the mycobacteria. Fifteen years ago, the adjuvant-active component of mycobacteria was found to reside in peptidoglycan, the structural polymer of bacterial cell walls. The minimal structural requirements for immunopotentiality were identified later and a synthetic analogue was made available commercially by the Pasteur Institute as their muramyl-dipeptide [MDP] adjuvant.

At the Society for Industrial Microbiology's annual meeting in Boston last year, workers from France, Japan and the U.S. described adjuvants/immune potentiators/immune modifiers derived from, or analogous to, microbially produced metabolites or structural peptidoglycans. These immune modifiers are used to arouse the immune system with endotoxin-like compounds, stimulate macrophage growth with minimal adjuvants units, or a combination of the two. Products of interest included trehalose dimycolate [an intermediate in cell wall synthesis], FK156 [a metabolite of *Streptomyces olivaceogriseus* that structurally resembles MDP] and bestatin [an immune-stimulating metabolite of *S. olivoreticuli*].

FK156 was discovered by the Fujisawa Pharmaceutical Co., Osaka, during a microbe-screening programme. In addition to screening for antibiotics [especially those that impair bacterial cell wall structures], the laboratories are screening for immune modifiers. Fujisawa's investigators have constructed an even more potent FK565 which is effective when administered orally and for a longer time.

Papers presented at the Boston meeting will be published in the society's *Developments in Industrial Microbiology* and the forthcoming *Journal of Industrial Microbiology*.

## ISOFLURANE

Isoflurane, a halogenated ether is the most recent addition to the volatile agents available to anaesthetists. It was first synthesised by Terrell in 1965, but early work suggested hepatocarcinogenicity in mice. This finding - which delayed clinical evaluation - was not confirmed in subsequent investigations, and isoflurane was released in the UK in 1983. Introduction was preceded by an unparalleled volume of pharmacological research, but surprisingly little has been published on clinical use of the drug. An editorial in the *Lancet*, 7 September 1985, pp 537-538, summarised about 20 papers on the properties and clinical use of isoflurane in man.

Although isoflurane may appear to be better in many ways than other potent volatile anaesthetics, it has at present two large drawbacks. It is far more expensive than existing agents, and if introduced widely into anaesthetic practice might necessitate a change to low-flow breathing systems or closed circuit anaesthesia to limit costs. Also, clinical experience with isoflurane in man is limited and some noxious effects may emerge with wider use. On present evidence, isoflurane is likely to be much used in anaesthetic care.

## SALMONELLA DISTRIBUTION IN HUMANS AND POULTRY

Raw chicken meat is a major source of salmonella infection within the community. The serotypes most commonly isolated from chicken meat are expected to be reflected in the serotypes isolated from the human population. Possible contamination by salmonella is routinely monitored during the processing of chicken carcasses before marketing. Inappropriate handling of the raw meat increases the risk of bacterial contamination both in the processing plant and in the domestic kitchen.

Between 1979 and 1984, 30 935 chicken and 17 467 human salmonella isolates were serotyped by the Salmonella Reference Laboratory, Institute of Medical and Veterinary Science, Adelaide. From this laboratory, C Murray reported in the *Communicable Diseases Intelligence* 86/5, pages 13 and 18, that the incidence of salmonella serotypes isolated from chickens changed markedly between 1979 and 1984:

### Increases in chicken isolates

	Chicken isolates (per cent)		Human isolates (per cent)	
	1979	1984	1979	1984
<i>S. sofia</i>	0	35.2	0.1	0.2
<i>S. singapore</i>	1.2	9.9	1.2	1.7
<i>S. orion</i>	<0.1	2.3	0.6	0.7
<i>S. give</i>	<0.1	5.8	0.6	0.7
Group total	<1.4	53.2	2.5	3.4

### Decreases in chicken isolates

<i>S. typhimurium</i>	39.6	10.2	38.6	28.3
<i>S. saintpaul</i>	11.1	0.2	3.4	5.5
Group total	50.7	10.4	42.0	33.8

It has been speculated that the changes in the incidence of *S. typhimurium* and *S. saintpaul* have been due to either normal variation or colonisation of chickens with *S. sofia*. A wide range of *S. typhimurium* phage types is known to colonise both man and animals, and any proposal to examine changes in distribution will necessitate a phage type survey in man and chickens.

The spread of *S. sofia* to other sources in the years after 1980 (Murray CDI 86/1 pp. 6-8) is consistent with the spread of a serotype from one animal source to other animals, to animal feeds and to the environment. However, there was not a corresponding increase in the number of human isolations, suggesting that *S. sofia* has low pathogenicity for humans. The spread of *S. sofia* in Australia illustrates how a salmonella can be introduced into our food chain from an unknown source. Perhaps we have been lucky in this instance that it has shown such low virulence. However the way in which spread occurred points out the vulnerability of our food chain to the introduction of potentially virulent serotypes.

These data indicate that changes in serotype frequency distribution in chicken meat are not reflected in changes in the frequency of human infection with these serotypes. There is ample evidence that salmonella serotypes vary in their capacity to spread through the food chain. Future work may provide information about factors which influence the frequency of human infection with particular serotypes.

## RETICULOENDOTHELIOSIS VIRUS BLUES

During the recent summer vacation between the 4th and 5th years of his Veterinary Science course at Sydney, **Grant Rawlin** worked with the Poultry Virology Unit at CSIRO Animal Health, Parkville. An insight into his activities follows:

There is a good book,  
'Disease of the Chook'  
by Hofstad and Calnek and co.  
Its descriptions are lengthy  
of diseases a-plenty  
and none of them easy to know.

Every '-itis' is mentioned,  
of birds young and pensioned,  
ILT, IB and so on.  
So I bought this great tome  
and took it straight home.  
About REV I would learn.

I turned past diseases  
that cause tumours and sneezes,  
past symptoms infectious and nutritional.  
Do you think I could find  
that disease on my mind?  
No way! I'd ignore the bits fictional.

Then excited I turned,  
past bacteria and worms,  
to a section marked "Neoplastic Diseases".  
And then to my horror,  
with fast-rising choler,  
I prayed to both Buddha and Jesus.

"An experimental disease..."  
it was passed off with ease,  
"...a disease with no relevance clinical".  
What a fool, then I thought,  
there's at least one report  
proves this ethereal disease physical.

But the thought that still  
was making me ill:  
He dismissed it in less than a page!  
With information like that  
my thesis will fall flat,  
and how can I sound like a sage?

"Oh, well", I then thought,  
I'll do as I ought  
and study and write for this thesis."  
- And that's how I came  
to work and find fame  
on *Reticuloendotheliosis*.

## ANTIBIOTIC CONFERENCE CANCELLED

An international conference, organised jointly by the United States National Institutes of Health [NIH] and the World Health Organisation [WHO] and called to review antibiotic use around the world was planned for March this year. A preparatory meeting was held in September 1984 to identify the matters to be discussed, many of them relating to overuse of resistance induced by distribution and prescribing.

The meeting was to have had working groups which would analyse the information given to doctors on antibiotic prescribing, prescribing patterns in various parts of the world, their effect on antibiotic resistance, and what could be done in terms of regulation and education to improve the situation. Intensive studies and sub-group meetings were planned for early 1985 to get the facts straight in preparation for a definitive conference a year later in the USA, to make firm recommendations.

According to a report in the *Lancet* of 8 February 1986, p 333, complaints from the pharmaceutical industry to the US Assistant Secretary of Health of anti-industry bias were followed in January 1985 by news to participants that NIH would not be funding the main meeting. In effect the meeting has been cancelled and replaced by a small meeting of 'experts' - the heads of the working groups and one or two nominees. NIH claims that this move reflects concern that the agenda planned was "not up to the high scientific standards of NIH".

WHO has now to decide whether or not to organise another conference, perhaps with other co-sponsors. WHO is faced with pressure from the US, its main source of funds, following enactment of an Amendment in the US last August. The Amendment limits the US' contribution to United Nation agencies to 20% of the agencies' budgets in 1987 - a reduction of 5% - unless the US gets a vote on budgetary matters in proportion to its contribution.

## TWO PROJECTS TO DEVELOP PELLETTED NDV VACCINE

Hanson's group at Wisconsin are studying the behaviour of NDV in the gut of chickens in order to select strains that are thermostable and resistant to intestinal secretions. They aim to incorporate them into a pellet as vaccine which will withstand storage and field handling.

White Leghorn chickens (7-10 weeks old) were inoculated with varied doses of lentogenic and mesogenic strains of NDV. Tubing was passed down the oesophagus into the crop. Each group of chickens was infused with one of six viruses: three lentogenic strains - La Sota, V4 and Coot, and three mesogenic strains - Roakin, Mukteswar and Komarov. Each chicken received a dose of virus in a volume (about 30 ml) sufficient to fill the entire gut. Chickens were bled weekly for four weeks for antibody assays.

A high dose of virus,  $10^9$  EID<sub>50</sub>, was necessary to induce a serological response typical of chickens that resist challenge. The response to a dose of  $10^5$  EID<sub>50</sub> was barely detectable. Mukteswar strain induced the highest antibody response. Trypsin levels as high as  $0.35 \text{ mg ml}^{-1}$  were detected from duodenal secretions and were assumed to be responsible in part for viral inactivation. Komarov strain was more resistant to trypsin than La Sota or Mukteswar. The authors, Shuaib MA, Spalatin J, McMillan BC & Hanson RP 1985 Vaccine 3 385-388, conclude that macromolecules (e.g. trypsin inhibitors) and pH buffers should be incorporated in pelleted vaccines. Use of concentrated virus may also help compensate for the inevitable decrease in virus activity in the gut after ingestion and prolonged storage of the vaccine.

This project has been going since 1982 when FAO provided funds for the senior author.

The Australian Centre for International Agricultural Research is sponsoring similar studies on the protection of village chickens against Newcastle disease at the Veterinary Schools in the University of Queensland and the Agricultural University of Malaysia.

Professor Peter Spradbrow described the project and gave an outline of results at the Sixth Australasian Poultry and Stock Feed Convention which was held in Melbourne last year [Proceedings pp.155-157]. In Australia, he said, NDV V4 virus has been found to spread between chickens kept under free-range conditions. Virus supplied with food has infected experimental chickens, spread to contact chickens and produced antibody responses. Virus strains selected for heat resistance have survived in coconut oil and palm oil that could be used for coating food pellets. Trials in Malaysia have indicated that chickens vaccinated orally with V4 vaccine will gain a high degree of protection against challenge with virulent virus. Challenge trials under laboratory conditions are being repeated in Malaysia. Attempts will be made to determine optimal dose, number of applications of vaccine and age for vaccination. It is hoped that the third year of the trial will be devoted mainly to studies in village chickens.

Professor Spradbrow discussed the potential for commercial poultry. Food is not used as a vehicle for vaccines in the industry, although some are applied through the drinking water. Water-borne vaccines may infect through the nasal mucosa and the oropharynx, not through the intestine. Oral vaccines are used in other species - the Sabin poliomyelitis vaccine bring a spectacularly successful example. Experimental rabies vaccines have been used in baits to vaccinate wildlife and experimental transmissible gastroenteritis virus vaccines have been used in pigs. He speculated that some avian vaccine viruses that infect through the intestine - ND, AE and IBD viruses - could be incorporated in commercial food.

## Animal immunogenetics

The First Australian Animal Immunogenetics Workshop held in Perth in 1984 provided a forum to discuss the importance and use of immunogenetic and other markers in a number of species. Five papers were summarised in the Veterinary Record (1985) 117 599-603.

Many species provide valuable models of disease in man, and the major histocompatibility complex (MHC) is an important marker for factors influencing reproduction and disease susceptibility. Work on the MHC in the chicken, which influences viral susceptibility and immune responses, was described by KJ Fahey, T Loudovaris and MR Brandon.

In the 1960s, workers found that by selecting for resistance to Marek's disease virus, they inadvertently selected for the MHC allele B21. In highly resistant chicken lines, the frequency of B21 is almost 100 per cent. Not only are there associations between resistance and the MHC but also correlations between performance traits such as egg production and the MHC.

The immune responses of three inbred lines of three different haplotypes were studied. Each differed in its response to synthetic polypeptides, to dinitrophenylated (hapten)-human gammaglobulin (carrier) and to a complex antigen, sheep red blood cells. Each line differed in susceptibility to experimental challenge with ILT virus.

In the future, by crossing the inbred lines of chicken and then studying the F<sub>1</sub> and backcross progeny, it is hoped to demonstrate associations between MHC alleles, immune responsiveness and disease resistance/susceptibility.

## **A resolution on ELISA - USA**

Because many in the American poultry industry who work with poultry health think it important to alleviate the great variation in reports on ELISA testing and language used, the following resolution was passed during the recent 57th Northeast Conference on Avian Disease.

### **Resolution: ELISA Reference Calibration Sera.**

Whereas, despite exacting comparisons of absorbance values of positive control sera in various assay comparisons between laboratories, there is great variation in the Positive to Negative [P/N] signal and/or the Sample to Positive [S/P] ratio, of various ELISA test systems, and

Whereas, assay sensitivity and specificity ranges are dictated by P/N or S/P and/or titre values, and

Whereas, this impedes inter-laboratory and user comparisons and interpretation of ELISA data, and

Whereas, both positive and negative reference calibration sera would serve to alleviate this problem and significantly advance national use of a single basic serological test for most avian infectious diseases, and

Whereas, the National Veterinary Services Laboratory [NVSL] is ideally suited for the preparation, maintenance and distribution of standard of reference calibration sera, and

Whereas, calibration control sera for each test system may be efficiently limited to one reference lot for all test systems with attendant simplification of calibration, quality control and storage.

### **Be it therefore resolved that:**

1. NVSL investigate the preparation, maintenance and distribution of standard avian ELISA reference calibration sera, and
2. NVSL evaluate using sera derived from one or several large lots of poultry all of which were inoculated with those agents frequently evaluated by ELISA techniques. These could include but are not limited to the following agents: infectious bursal disease, Newcastle disease, infectious bronchitis, infectious laryngotracheitis, avian encephalomyelitis and Marek's disease viruses, adenoviruses and pathogenic avian mycoplasmas, and
3. Dilution factors for determining positive/negative thresholds of pathogenic avian mycoplasmas be determined.

## **Does conventional vaccination protect UK chickens against variant NDV?**

During 1984, 23 outbreaks of ND were diagnosed in domestic fowl in Britain. Alexander and his group at Weybridge used mouse monoclonal antibodies against NDV Ulster 2C to show that the viruses responsible for 22 outbreaks were identical to variant avian paramyxovirus type 1 [PMV-1] isolates which caused the widespread epizootic of neurotrophic disease in British pigeons during 1983-84. Epizootiological tracing indicated that the virus had spread from diseased feral pigeons via untreated contaminated feed.

Restrictions placed on the affected food stores and slaughter of infected fowl under the 'stamping out' policy applicable at the time brought the outbreaks under control. However, the poultry industry decided not to continue financing the insurance scheme for compensation for birds slaughtered under a 'stamping out' policy and, as a result, national control measures in Great Britain reverted to a vaccination policy in September 1984.

At that time inactivated vaccines and NDV B1 live vaccine were licensed for use in poultry. This contrasted with the situation up to September 1981 when NDV La Sota was also allowed as a live vaccine.

Although the NDV responsible for 22 of the 23 outbreaks in 1984 was known to be a distinguishable variant, it was felt that the permitted vaccines would be antigenically sufficiently similar to afford protection against that virus as well as more classical pathogenic NDV.

Alexander DJ and Parsons G 1986 Veterinary Record 118 176-177 tested this hypothesis by using a vaccination procedure recommended before 1981 by the UK Ministry of Agriculture for birds possessing maternal antibodies and by challenging with the variant virus.

The overall immune responses of fully susceptible chickens to both live vaccines were similar, with the HI titres to the variant antigen being consistently one to three log<sub>2</sub> lower than for the international reference antigen, NDV-F. Despite this, there was little difference in protection obtained with either NDV-B1 or NDV-La Sota.

The protection afforded by NDV-B1 in chickens is in contrast to results obtained with this vaccine in adult pigeons by the same workers, indicating that caution is needed in extrapolating the use of vaccines and protective immunity from one species of bird to another.

## Report points to poultry price fixing

The report, which was released on 19 February 1986, follows an inquiry by the Commonwealth Prices Surveillance Authority in relation to the basis for establishing prices in various sectors of the table chicken industry, and whether surveillance under section 21 of the Prices Surveillance Act 1983 should be exercised by the Authority over the prices of goods supplied in any sector.

The table chicken industry is now highly concentrated, with corporate affiliates and subsidiaries of two major groups - Amatil and Inghams - supplying almost 80 per cent of the market for dressed chicken, from large vertically integrated operations. Other processors supply the remainder of the market, relying almost entirely for their supplies of day old chicks from affiliates of the two major groups. An exception is Manos Poultry Industries, a SA processor with its own supply of day old chicks. Chicks are raised to slaughter weight by growers contracted to processors, or on company-owned farms.

Supermarkets and take-away food shops are the major buyers of processed chicken, accounting for about 60 percent of the industry output. Over 60 per cent is sold as fresh produce, either whole or cut in pieces; demand for frozen chicken is declining in favour of fresh. Total demand is rising, and is influenced to some extent by prices of other meats, especially white meats. In constant value terms, wholesale and retail prices have been declining over time. Profitability in the industry appears to be recovering from low levels in recent years. Movements in retail chicken prices are significant influences on the Consumer Price Index.

The Inquiry was especially concerned to examine the various sectors of the industry in order to discover whether market power resulting from concentration of supply was being exercised in prices charged. In the feed and poultry vaccine sectors, prices appeared to be presently determined on an adequately competitive basis. In the growing sector, fees for growers are usually determined by negotiation in committees established under State Government legislation, on which processors, growers and State Governments are represented. Whilst the authority observed some advantages in such arrangements for growers and processors, it was unable to conclude that fees determined in the committees were necessarily appropriate in the current circumstances. The provisions of the Prices Surveillance Act 1983 do not extend to State Government agencies.

In evidence to the authority, the Trades Practices Commission said that Amatil and Inghams "which trade through companies where there is a considerable interconnection of ownership, are able to control the prices at which day old chicks are supplied to the independent processors and at the same time are competing against those processors in the market for the finished product." In the sale of day old chicks by the major processor groups to the other processors, the Authority was unable to satisfy itself that prices are presently set on a competitive basis. Similarly, evidence given at the inquiry did not satisfy the Authority that major processors related by ownership were operating at arm's length in marketing dressed chicken.

The authority recommended that surveillance under section 21 of the Prices Surveillance Act 1983 be exercised over the supply of day old chicks and of dressed chickens sold at wholesale by companies affiliated with Amatil and Inghams.

Amatil wholly owns Steggles Holdings, a holding company which incorporates wholly-owned integrated chicken subsidiaries, as well as operating the NSW and Victorian "Big Rooster" fast food outlets. Table Talk Poultry farms is a 50-50 joint venture of Amatil and Fielder Gillespie Davis. Golden Poultry is 49 per cent owned by Amatil, with Inghams owning the rest of the shares. Inghams is a fully integrated chicken processing enterprise in its own right, covering all states except WA and Tasmania. Golden Poultry operates in South Australia, Victoria, WA and Tasmania. Corporate relationships are depicted in an appendix to the report.

Report No. 7 - Inquiry in Relation to the Table Chicken Industry - is available, gratis, from the Prices Surveillance Authority, 10 Queens Road, Melbourne 3004, telephone (03) 267 3700 or from PO Box R364, Royal Exchange, Sydney 2000, telephone (02) 27 5677

## Herpesviruses help produce avian adeno-associated parvovirus

Herpesviruses ILT, HVT and pseudorabies virus (PRV) provide complete helper activity for the production of infectious avian adeno-associated virus (AAAV) in chicken cells. Bauer HJ and Monreal G 1986 Journal of General Virology 67 181-185 found that the multiplication of ILT virus or PRV were not affected if used as helper viruses but that the presence of AAAV in the infected chicken cell reduced the multiplication of HVT.

## ALL WE LIKE CHIPS

Lent is spent so crave these indulgences. Following the success of the direction finding **Mecca Detector** [from CMOSQUE Technology], every silicon valley has been exalting us with the latest ecumenical catalogue of computer assisted spiritual aids. In the beginning was the Word Processor; now you can have....

**MICRO-FISH** Another new addition to the Rome-based software range from *HALOSOFT*. Accurately calculates to the 0.7 portion the number of baguettes and cans of sardines needed to feed 5 000, allowing for vegans and half serves for the kiddies.

**VATICAN-O-MAT** [Fully JS-DOS compatible] The user-friendly Sunday trading business package integrates a multi-function Stigmatabase [locating all sites of outstanding devotional interest within a 40 day/night radius]; full resolution Turin-style spreadsheet in non-erasable memory and *Miracle*, the accounts rationaliser which turns base metal into Collect contributions. Includes Holy RAM of God dedicated host processor; a complete suite of altartop accessories and choice of fonts.

**HIC HACK HOC [SELECTED TEXT PROCESSOR]** [By Act of the Apostles] Pinpoints precisely all those awkward Sundays after Hexadecima. All standard edit facilities supported - ideal for Numbers crunching, justifying Job and de-bugging Deuteronomy. With example texts from St Paul's first ASCII file to the Corinthians.

**COMMUNICANT'S PROGRAM** Confessional-style discreet components; with full memory scan, error checking and W.Y.S.I.W.Y.G. [What You Sin Is What You Get] pennance collator.

**LETUS 1-2-3** [*Kneel, Pray and Hope*] Supplications program from Genuflect-and-Survive. High-level adaptation of the already established Jazz, Symphony and Hymns (ancient and modem).

### COMING SOON

Resurrect those dead files with **LAZARUS' Up and Running**; The **OUT-OF-EGYPT** flight simulator; and **HEAVEN** [The terminal emulator]. See also the full range of arcane-action games software - including **Paxman**, **Donkey King**, **Holy Ghost-busters** and the ever popular fantasy adventure, **Hitch-hiker's Guide to the Galilee**.

Meanwhile, for those in the Here and Now who can't tell their ASCII from their elbow and don't want to but can feel the impact of computers, an article on The Next Generation of Personal Computers by JP Crecine 1985 Science 231 935-943 is worth searching out. Lucid and free of jargon, Crecine explains how we got where we are and where we're going. Common technology and technological trends, he argues, have not led to compatible microcomputer systems and portable applications software but to software incompatibility and fragmentation of the market for microcomputing. The problem is the same for academic and non-academic institutions and for professionals who need access to a body of specialised applications software.

The problem is straightforward, even if the solution has not been. What is needed is a systems software base (an operating system) that is stable and "floats over" the volatile hardware and technology that represent the world of microcomputing. With a stable base applications software developers can build without being forced to target their efforts at only one of the IBM PC's, PC clones, Apple Macintoshes or VAX-based machines of today. A consortium from a number of American universities has been working closely with major computer manufacturers - AT&T, Apple, IBM, Digital Equipment, Hewlett-Packard, NEXT, SUN Microsystems and Texas Instruments - to create the necessary conditions for software portability in the next generations of personal workstations. The necessary stable systems software base is built on top of UNIX, a hardware-independent operating system originally created at Bell Laboratories. Software and operational capability 'sell' hardware and therein lies an attractive growth dynamic for the market. 'User friendly' may yet mean just that.

Six more articles on computers which follow Crecine's in this issue of Science (28 February 1986) discuss interfaces, languages and hardware.



## MORBIDITY AND MORTALITY IN MERLINS

The merlin (*Falco columbarius*) is a small bird of prey. In the wild it is found in North America and Eurasia. The merlin is declining in numbers in Britain and little is known of its susceptibility to disease or causes of mortality. JC Cooper and NA Forbes 1986 *Veterinary Record* **118** 232-235 reviewed the diseases and causes of death in 13 merlins received for clinical investigation and 35 for post mortem examination between 1965 and 1983.

In eight of the cases examined post mortem, no diagnosis was made but another eight died of a fatty liver-kidney syndrome. Other causes of death included enteritis/proventriculitis (three birds), coccidiosis (three) and septicaemia (two). A variety of incidental findings was noted, for example, parasites and non-fatal lesions. Of the 13 clinical cases, five had bumblefoot and two each had fractures and reproductive failure. There were individual instances of other diseases.

For a number of reasons, a survey of this kind is always liable to bias. The captive birds submitted for clinical or post mortem examination are likely to be those with which the falconer or aviculturist cannot cope himself and thus simple clinical problems, such as minor injuries or well recognised and easily treated diseases, are unlikely to be seen. Similarly, if a merlin is killed by a cat or fatally injures itself while being flown for falconery, it will probably not be sent for post mortem examination. Nevertheless, the cases in this paper appear to represent the largest survey to date of morbidity and mortality in the merlin.

## A bursal disease vaccine increases in virulence during passage in chickens

Muskett JC, Reed NE and Thornton DH of the Central Veterinary Laboratory, New Haw, Weybridge, Surrey, England, describe their work on this vaccine in *Vaccine* 1985 **3** 309-312. The IBD virus had been passaged 50 times in cell cultures but had not been plaque purified or otherwise genetically purified before incorporation in the vaccine. The vaccine virus spread to unvaccinated birds and increased in virulence during passage in susceptible birds as shown by a significant decrease in the bursa:body weight ratios and increase in bursal damage of sufficient severity to cause immunosuppression. The Weybridge workers selected five virus clones by plaque purification of the vaccine, including one which protected chickens against challenge, did not damage the bursa of Fabricius and was not transmissible. They suggest that the increase in virulence of this vaccine was due to the selection of a virulent sub-population which had been present in the vaccine since its isolation and which had not been eliminated during passage in cell culture. Genetic purification cannot guarantee future stability, and cloned vaccine seed strains should be examined carefully for lack of potential to regain virulence. This is particularly so for RNA viruses, such as IBD virus, which are highly prone to mutation.

From the same laboratory, Chettle NJ, Eddy RK and Wyeth PJ 1985 *British Veterinary Journal* **141** 141-145 report the isolation from turkeys of an IBD virus closely resembling the prototype of IBD serotype 2. The presence of antibodies to serotype 2 in all the grandparent, parent and fattening turkey flocks tested indicates that the infection is probably widespread. Whether infection of young poults with IBD virus causes any specific tissue damage or immunosuppression is being looked at.

## Protective immunogen of IBD virus

Antibody protects chickens against IBD and the disease is most effectively controlled by vaccinating breeding hens, previously sensitised by exposure to the live virus, with inactivated oil-adjuvant vaccines. Vaccination induces high levels of antibody which is transferred from the hen to the chicks via the yolk and protects them for the critical few weeks after hatching. An effective subunit vaccine produced by recombinant DNA technology would not require the use of expensive specific pathogen free poultry to produce high titres of the virus and should also be safer, better standardised and therefore more reliable.

When the Australian type 1 isolate of IBD virus (002/73) was purified by Fahey *et alia* 1985 *Journal of General Virology* **66** 1479-1488, it was found to have two major polypeptides of approximate mol. wt. 37K and 32K and three other polypeptides (91.5K, 41.5K and 29K).

Fahey *et alia* 1985 *ibid* **66** 2693-2702 have since shown that purified 32K polypeptide induces the production of antibodies which neutralise the virus *in vitro* and passively protect chicks from infection. Conversely, 37K and 41.5K polypeptides induce antibodies which are readily detectable by ELISA but which have a low or no virus neutralising activity and do not protect chicks against infection. As there was no evidence that the anti-32K and anti-37K antibodies act synergistically in the neutralisation of IBD virus, the 32K polypeptide was concluded to be the major protective immunogen of IBD virus. Only type 1 IBD virus is known to cause clinical disease in chickens and hence it would seem likely that a subunit IBD vaccine containing all or part of the 32K structural polypeptide could induce antibodies in breeding hens that would protect their progeny against pathogenic virus.

## Fowl pox in the trachea of point-of-lay hens

Griffiths GL and Purcell DA 1985 Australian Veterinary Journal 63 91-92 reported a flock of 2000 POL hens in which mortality increased to 10 per day. Few birds were sneezing and fewer looked sick. Lesions resembling ILT were seen in the larynx and trachea. There were no lesions on the skin. Eosinophilic intra-cytoplasmic inclusions were seen in the hyperplastic epithelium of the larynx. Pox virus was cultured from the trachea. Another 7000 older hens on the farm were unaffected.

## COMING EVENTS

**AVA AGM**, Surfers Paradise, 11-16 May 1986  
contact Qld LAC, Box 34, Indooroopilly 4068

**AVPA AGM and Scientific Sessions** will be held in association with the  
**Refresher Course in Poultry Health**, Sydney, 26-30 May 1986  
contact The Post Graduate Committee in Veterinary Science, PO Box A561, Sydney South 2000

**IVth International Symposium of Veterinary Laboratory Diagnosticians** Amsterdam 2-6 June 1986  
contact Secretariat of the Symposium, c/o Organisatie Bureau Amsterdam bv, Europaplein, 1078 GZ Amsterdam The Netherlands.

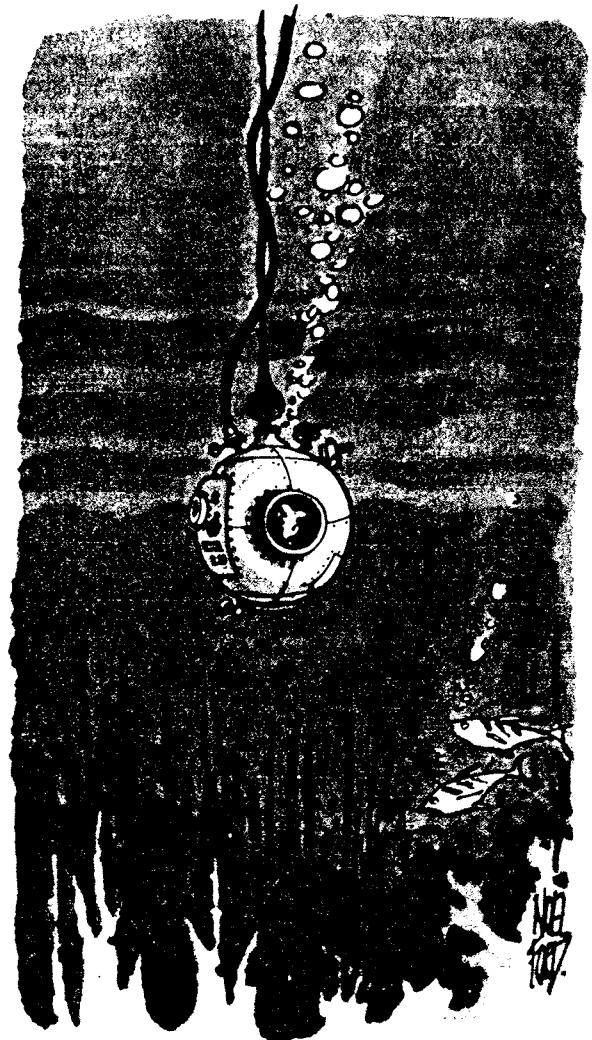
**Disease and management of threatened bird populations.** Symposium to be held at the XIX World Conference of the International Council for Bird Preservation, Kingston, Canada, 20 June 1986  
contact JE Cooper, Royal College of Surgeons, Lincoln's Inn Fields, London WC2A 3PN, UK for details of the Symposium.  
contact ICBP, 219c Huntingdon Road, Cambridge CB3 0DL, UK for details of the Conference.

**AVPA Avian Histopathology Workshop**, Camden, 17-19 February 1987  
contact Garry Cross

**XXIII World Veterinary Congress**, Montreal, 16-21 August 1987  
contact XXIII Congress Secretariat, 3450 University Street, Montreal, Quebec H3A 2A7, Canada.

## Contributions

After a heavy fall, the dollar spent a quiet night maintained on a life support system in the Prince Henry's intensive care unit. Specialists, suspecting that it had sustained irreversible injuries but refusing to admit defeat, fought a life-and-debt struggle to breathe some life into the fast deteriorating patient. Initial biopsies indicated a marked budget deficiency directly related to severe withdrawal. On the Sydney Stock Exchange this morning the dollar's condition was described as "better than they had hoped". Hope springs eternal....but nourisheth not. Transfusions and contributions are needed; coin accepted, but notes preferred. Those received from Grant Rawlin, Rod Reece and Chris Murray, IMVS, are acknowledged with great thanks by Trevor Faragher, NBSL, Private Bag 7, Parkville 3052



*"Personally, I think it's rather cruel, keeping them in those little round bowls."*