

serving as many living species as possible, if only for aesthetic and historical reasons". This excellent statement is followed by one which may, I believe, cause some confusion, namely, "There is however, no reason to think that the damage done to the populations of wild birds by pesticides is as yet comparable to the damage done by hunting, thought to be responsible for the deaths of 2 million game birds a year in North America alone . . ."

To the hunter, and to the game manager, the new environmentalist could and should be a most valuable and numerous ally. How regrettable it is, however, that the sport hunting of game under prudent management schemes now in almost universal application is so often accused of hastening the destruction of species! Let us not forget that North America would never be supporting its abundant game populations were it not for public, and specifically hunter, demand. I can assure your readers that legal recreational cropping does not and cannot endanger the continued existence of any North American game bird. Persistent pesticides, however, are believed responsible for the near complete disappearance of the peregrine falcon from most of its world range, and, as John Maddox points out, for low and possibly decreasing recruitment rates in other species as well.

The "damage" done to cattle populations by butchering is incomparably greater than that done by anthrax. Which, however, demands our greater effort and attention? The definition of the issues is, I believe, the most fundamental problem facing environmental scientists.

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Population

SIR,—While welcoming the recent decline in the birth rate in England and Wales, we are disturbed at the assumption by Mr Wynn in your correspondence columns (*Nature*, 236, 181; 1972) that this is a continuing trend which will automatically lead to long-term stabilization of our population. Demographers do not base their projections on the crude birth rate in any one year, which fluctuates considerably, but on available data on long-term fertility trends, such as the "Family Intentions' Survey"¹ mentioned by Aubrey Manning, showing that the "ideal completed family size" desired by women is 2.5 children and that "without economic constraints" this rises to 3.5 children.

We now appear to be experiencing a similar phenomenon to that of the 1930s, when generally adverse economic conditions and widespread unemployment caused parents to postpone their family building. At the time it was feared that a falling birth rate might lead to a decline in population, but the birth rate did not at any time fall to the same level as the death rate. Consequently the long-established trend of natural increase remained uninterrupted², and, as we all know, population has grown considerably since 1931. It would seem that today's "relatively" low birth rate is due not to any desire by parents to have replacement-size families, but to decisions "not to have another child until things get better". Economic factors clearly do affect the birth rate, but who would recommend permanent and widespread unemployment as a desirable method of population control? Neither can it be said that, at this level, it is an effective method—it is worth noting that natural population increase is still running at over 100,000 per year³ and that any increase, however small, cannot be sustained in the long run. With increasing absolute numbers of women entering the child-bearing period, a further decline in the birth rate will be necessary to keep the absolute number of births stable at any given level. It will be interesting to see what happens during the next few years.

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¹ *Family Intentions*, Office of Population Censuses and Surveys (HMSO, 1971).

² Parsons, J., *Population versus Liberty* (Pemberton Books, 1971).

³ Registrar General's Weekly Returns for England and Wales (1972).

PCBs in Copying Paper

SIR,—From the article by Masude, Kagawa and Kuratsune on PCBs in carbonless copying papers (*Nature*, 237, 41; 1972), your readers might receive the impression that PCBs are currently used in carbonless copying papers and, by implication, that users of these types of papers might be exposed to toxic hazards similar to those reported in the mass intoxication incident in Japan in 1968.

In view of the current very understandable concern over the question of environmental toxicants and the viewpoint expressed in *Nature* (236, 433; 1972), we feel that the facts relating to the use of organic solvents in carbonless copying systems should be made known to your readers.

Wiggins Teape are the largest manu-

facturers of carbonless copying paper in Europe, and when PCBs were first reported as persisting in the biomass (*New Scientist*, 32, 612; 1966), the use of these solvents was reconsidered. The Yusho poisoning incident was taken into account, but as this was due to a higher chlorinated PCB with different toxicological characteristics from that used in copying systems, this was not considered to be of direct relevance; considerable toxicological investigation had been undertaken by Wiggins Teape in conjunction with Inveresk Research International on the lower chlorinated PCBs used in copying systems, and it was shown that the use of low chlorinated PCBs as solvents presented no hazard to man in the form and amount used.

Nevertheless, in view of the possible but unascertainable hazard to the environment in the long term, it was decided to seek an alternative solvent for use in carbonless copying systems.

A suitable solvent with similar physical characteristics was chosen and extensive toxicological tests were carried out to establish rapid biodegradation and freedom from toxicity.

Since June 1970, no PCBs have been used by Wiggins Teape in the manufacture of carbonless papers, and we know that other responsible manufacturers of similar papers have followed our lead.

Yours faithfully,

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Knuckle Walking

SIR,—E. N. Tiratsoo asks (*Nature*, 236, 472; 1972) whether the knuckle-walking situation of football linesmen is different in Chicago. It is indeed, with respect to both "football" and "linesmen". In American football, a lineman is one of the players, often bearing a marked physical resemblance to one of the larger anthropoid apes. At numerous intervals in the course of play he will assume a crouching three-point stance, the forward support being the knuckles of one hand. During these intervals knuckle-walking may occur. This is an unsanctioned activity and may result in a penalty to the offender's side if detected by an official.

Yours faithfully,

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