negatively adsorbed with respect to the other constituents, the method outlined may give a means of determining the actual composition of the surface layer.

The measurements of the partial vapour pressures of water and alcohol in solutions containing various concentrations of lithium chloride which have recently been made in this laboratory by Shaw and Butler [2] provide the data required in these equations. Mr. A. D. Lees has determined the surface tensions of some of these solutions in order to test the feasibility of this method, and has obtained provisionally the following ratios for $\Gamma_{(alc.)}/\Gamma_{(water)}$ in 1*m* lithium chloride solutions:

Molar fraction of alcohol	6·4	25	80
$\Gamma_{(alc.)}/\Gamma_{(water)}$ . . .	0·3	0·7	14

The vapour pressure measurements are being extended to solutions containing a lower proportion of alcohol, and it is hoped that eventually results will be obtained for a complete range of solutions.

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[1] For example, Goard and Rideal, *J. Chem. Soc.*, **127**, 1668, 1925; S. Palitzsch, *Zeit. physikal. Chem.*, **147**, 51; 1930.
[2] *Proc. Roy. Soc.*, A, **129**, 519; 1930.

Disease in Nature.

MOST naturalists would, I think, agree that wild animals have the appearance of exuberant health, and that it is quite unusual to meet with any obvious illness or disease. But it is a very optimistic inference that civilised man might achieve the same state.

So far as parasitic diseases are concerned, natural communities of animals, where there is no hygienic interference, seem to come into a state of equilibrium with their parasites which is rarely broken through into either the complete destruction of the parasite or the appearance of an epidemic in the host. Archdall Reid used to argue that human infections should be treated in the same way and left alone to do their worst.

A great number, however, probably the majority, of the bodily defects which give rise to the 'sub-health' of human communities are due not to parasites but to age. Man's body begins to decay at an age which varies widely in different individuals, but decay has generally definitely set in by the time a man is thirty: his lungs are losing their elasticity, his aorta is getting fibrous, his respiratory and circulatory mechanisms are relatively inefficient: few men can play first-class football above thirty. By forty-five even his brain is growing smaller. A large and increasing part of our population have, therefore, bodies which have deteriorated by the natural process of ageing, and there is no evidence that the enormous hygienic and medical advances of the last hundred years have done anything to postpone the effect of age. The expectation of life at birth has nearly doubled, but for old men it is no greater than it used to be.

In natural animal communities such age-deteriorated individuals are eliminated by the ordinary processes of selection. The same would presumably happen in man if survival depended on physical efficiency. Artificial breeding experiments (for example, with mollusca) indicate that the possible length of life is much more than that usually attained in the wild state. The wild populations are, therefore, healthy in a way which human populations can never hope to achieve. It does not seem likely that hygienists can do anything very effective in altering the tissues on which injurious agents work, though they can, of course, do much in protecting man from such agents. Whether the age at which the body begins to go downhill is a heritable quality I do not know: it probably is, for length of life is intensely inherited. The most likely eugenic procedure seems, therefore, to be to select for age at death.

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THE discussions in NATURE of April 25 and May 9, on the occurrence of disease among animals and plants living under natural conditions, are of importance from several points of view, both economic and scientific. While I do not admit the validity of the reviewer's distinction between internal predators and diseases, yet, for the sake of the argument, we can eliminate the huge death-roll of insects due to insect parasites and still leave a large death-roll due to diseases.

Bacterial diseases are common among insects, especially during the larval stage; the larvæ of Lamellicorn beetles living in the soil being very subject to attacks of bacteria. In the tropics many Lepidoptera larvæ suffer from such diseases. Fungal diseases among insects are common all over the world, but more noticeably in tropical rain forests, where they are sometimes the chief controlling factor in limiting the numbers of some insects. Economic entomologists are familiar with these facts.

Insects attacked by these diseases show all the signs of "disintegrative and deteriorative disturbances" shortly before death. By saying that these insects are 'diseased' I may be "influenced by human prejudices", as Mr. Maulik contends, but if we use the word in connexion with human beings, then it is also applicable to other animals. No one would ever talk of Nature being 'diseased' or 'healthy', but we can apply those terms to animals and plants. The word 'disease' is more convenient than the phrase "disturbed balance of metabolism".

Disease among insects leads to a speedy death, and the superficial observer only notes the active, healthy specimens. In spite of the great importance of a correct knowledge of the death factors of animals and their relative values as selective factors, in our understanding of natural selection, only superficial attention, so far, has been given to this subject. Among insects the greatest mortality falls upon the eggs and young, perhaps some eighty per cent, and the chief death factors are diseases (including parasitism). If we ignore this fact and base our statistics upon the idea that all, or the greater part, of the mortality falls upon the adult, and has selective value, we are likely to reach wrong conclusions. For this reason, if for no other, it is necessary to recognise diseases (including parasitism) among insects, and their overwhelming value as death factors.

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Vegetable Juices as Fixatives.

SINCE the article on "A Modified Gold Chloride Method for the Demonstration of Nerve Endings" was published by Mr. Fred W. Gairns, of Glasgow,[1] we have been experimenting with vegetable juices, other than lemon. This communication is intended only as a preliminary announcement of the uniformly satisfactory and constant results that we have obtained with them, and we hope to be able to publish an account of our investigations in greater detail soon in the *Mysore University Journal*. The following