containing varying concentrations of the substances in question. None of the substances used was strongly fungicidal and, although the more toxic produced a marked reduction in growth in relatively small concentrations, growth was not completely inhibited at very much higher concentrations. It was therefore found convenient to record as the toxic concentration the quantity required to reduce growth to less than 5 per cent of the controls. As the toxicity of these compounds is increased with increasing acidity, it is necessary to state the *p*H of the medium when quoting toxicity figures. The results of the tests described above are shown in the accompanying table, in which the second column relates to the tests on agar and the third column is derived from the results obtained in nutrient solution.

EFFECT OF PLANT-GROWTH SUBSTANCES ON THE GROWTH OF *N. galligena*

Substance	Growth-rate (mm. per day)	Toxic conc. in p.p.m. (*p*H 3·8)
2,4,6-Trichlorophenoxyacetic acid	1·22 (± 0·07)	40
1-Chloro-2-naphthoxyacetic acid*	1·07 (± 0·02)	40
α-Naphthaleneacetic acid	1·40 (± 0·05)	20
β-Indolylbutyric acid	2·37 (± 0·11)	60
β-Indolylacetic acid	2·59 (± 0·04)	100
β-Naphthoxyacetic acid	2·67 (± 0·16)	60
2,4-Dichlorophenoxyacetic acid	2·20 (± 0·09)	80
Control	3·01 (± 0·09)	

* Supplied by F. E. Smith, of Pal Chemicals, Ltd.

In preliminary field trials these substances were applied to established cankers at a strength of 1 per cent in lanoline; the cankers treated with β-indolylbutyric acid showed a marked improvement over the controls, but the others showed little difference.

These failures may possibly be due to the use of concentrations which were high enough to be toxic to the host.

I am grateful to Dr. L. C. Luckwill and to Mr. R. W. Marsh for their advice during the course of this work.

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A New Dry Test for Gold

DURING the course of a systematic investigation of the mechanism of the blue mantle test for tin[1], it has been recently observed in these Laboratories that gold shows a similar reaction, but the colour of the mantle is a brilliant green.

The following procedure is adopted. Add to the gold salt in a porcelain dish a quantity of concentrated hydrochloric acid. Add a speck of metallic zinc and immediately dip a test tube, full of water, in the solution over the point where the hydrogen is bubbling up. On holding the test tube in the hottest portion of a Bunsen flame, a brilliant green mantle forms around the bottom of the test tube. The test is sensitive to 0·1 mgm. of gold per c.c. of concentrated hydrochloric acid. The presence of tin, however, interferes, and the green mantle is replaced by the characteristic blue mantle of tin. Copper also interferes.

As mercury, lead, silver and even platinum ions do not interfere, gold can be easily detected in a tin-free ore or alloy by dissolving the nitric acid insoluble portion in *aqua regia* and then applying the above test.

The mechanism of the test is not known.

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[1] Meissner, H., *Z. Anal. Chem.*, **80**, 247 (1930). Schröer, E., and Balandin, A., *Z. Anorg. Chem.*, **189**, 258 (1930).

Demonstration of the Heart Beat

THE explanation of Dr. C. A. Beevers' observations[1] (which I can confirm and to which I would add the further observation that the puffs of smoke correspond to cardiac systole) would seem to lie in the close resemblance of the human chest to the box used for the production of smoke rings to which he refers. Both have relatively rigid walls with a diaphragm and an orifice. In the case of the chest the contraction of the heart muscle during systole, acting from the relatively fixed great vessels of the head and arms, pulls its diaphragmatic attachment upwards, thus reducing the volume of the thorax. Air, being the most easily displaced thoracic content, is expelled in small jets corresponding to each cardiac systole and produces the effect noted by Beevers.

That it is not brought about by arterial pulsation in the mouth is certain because, during the process of blowing smoke from the mouth, the latter is in free communication with the lower air passages, and the comparatively small effect of local vascular changes would be lost in the very much greater volume of air (approximately 3 litres) present in the lungs and respiratory passages.

A possible additional cause is the throwing during each systole of upwards of 60 ml. of blood into the pulmonary circulation with displacement of air from the alveoli as the pulmonary capillaries dilate. This, however, is likely to be a much more gradual process and to be delayed for a considerable interval after systole.

Changes in the volume of the heart itself during the cardiac cycle might be thought to play a part; but consideration will show that any expulsion of air would be diastolic in time and also more gradual than a similar effect accompanying systole, being dependent on the flow of blood into the thorax via the superior and inferior venæ cavæ rather than its sudden expulsion from the heart.

It is doubtful if the accurate measurement of these pressure changes suggested by Dr. Beevers would provide any more valuable evidence of the condition of blood vessels than can at present be obtained by direct observations on an artery, as with various forms of sphygmograph, or on the volume changes in a limb with a plethysmograph.

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[1] Beevers, C. A., *Nature*, **161**, 65 (1948).

ON looking further into the literature, I find that the 'cardio-pneumatic movement' has been described many times previously. For example, Haycroft and Edie (*J. Physiol.*, **12**, 426; 1891) quote C. Voight as having recorded the phenomenon in 1865. However, these workers seem to have used a glass tube inserted into the mouth with a drawn-out portion in which the movements of the smoke particles are observed.

C. A. BEEVERS