TABLE 1

Mould growth as wet weight of mycelium in gm., penicillin formation (units/c.c.) and *p*H developed after 8 days in 40 c.c. medium containing basal constituents, 1·5 per cent glucose and compound under test in amount equivalent to 56 mgm. of nitrogen

Compound	Wet weight of mycelium (gm.)	*p*H	Titre units/c.c.
dl-Norleucine	0·87	7·4	100
l(−)-Leucine	3·14	8·3	240
l(−)-Tyrosine	2·5	7·9	225
l(+)-Cysteine	1·2	6·3	200
Triethylamine	0·88	6·4	160
Uric acid	1·67	6·3	160
Allantoin	1·88	5·3	100
Uracil	1·34	6·5	180
Sodium nitrate	0·60	7·3	150
Potassium nitrate	0·85	7·4	200
Nicotinic acid	1·04	5·4	200
Gelatin	2·0	8·1	190

that the nitrogen content was 56 mgm./40 c.c. medium (that is, 140 mgm. per cent).

The initial *p*H of the medium was adjusted in all cases to 5·6.

Since, when the active fraction from peas was used at its most stimulating concentration, 1·5 gm. per cent of glucose (or its carbohydrate equivalent) was present, this concentration of glucose was added to each compound under test.

In the experiments described *Penicillium notatum* 1249.B21 in surface culture was used, but preliminary experiments with submerged aerated cultures show that similar results may be obtained.

The wet weight of mycelium has been used as a measure of mould growth.

Representative results with various nitrogen-containing compounds are shown in Table 1. Low yields were obtained with the following amino-acids and other nitrogenous compounds: *dl*-tyrosine, *dl*-serine, *l*(−)-cystine, *dl*-aspartic acid, *l*(+)-glutamic acid, *l*(+)-arginine, *l*(+)-histidine, *dl*-tryptophan, *l*(−)-proline, asparagine, trimethylamine hydrochloride, diethylamine hydrochloride, hypoxanthine and potassium thiocyanate. The following nitrogenous compounds had no stimulating effect on penicillin formation although growth in their presence was good: glycine, *dl*-alanine, *dl*-valine, *d*-isoleucine, *dl*-phenylalanine, *l*-dihydroxy-phenylalanine, *dl*-methionine, *dl*-lysine, urea, *n*-propylamine and choline.

The results show that a wide variety of nitrogen-containing compounds has an effect in stimulating penicillin formation, and we cannot relate this stimulating effect to the presence of any definite chemical group in the substances tested.

It will be seen that gelatin forms a good basis for a synthetic medium. Using gelatin as a source of nitrogen, sources of carbon other than glucose have been tested. Typical results are shown in Table 2.

TABLE 2

Mould growth, penicillin formation and *p*H developed after 8 days, in 40 c.c. of medium containing basal constituents, gelatin to give a nitrogen content of 56 mgm., and carbon-containing compounds under test to give a concentration in the medium of 0·6 gm. (that is, 1·5 gm. per cent)

Compound	Wet weight of mycelium (gm.)	*p*H	Titre units/c.c.
Xylose	3·11	7·9	150
Glucose	2·0	8·1	190
Sorbose	1·5	7·9	150
Maltose	2·06	7·9	150
Trehalose	2·03	8·5	260
Raffinose	1·85	8·0	150
Inulin	1·98	7·9	240
Adonitol	1·61	7·7	260
Methyl alcohol	0·66	7·2	0
Ethyl alcohol	1·57	7·8	25
Sodium acetate	0·43	8·8	0
Ethyl acetate	0·46	5·0	0

The results show that when good growth did occur there was marked stimulation of penicillin formation, and that a variety of carbon-containing compounds could be used.

As with the active fraction prepared from peas, the concentration of sodium chloride in the synthetic media had a marked effect in stimulating penicillin formation, as will be seen in Table 3.

TABLE 3

The effect of the concentration of sodium chloride on penicillin formation in the basal medium containing gelatin equivalent to 56 mgm. of nitrogen and raffinose at a concentration of 0·6 gm. per 40 c.c. of medium

NaCl %	Lactose %	Wet weight of mycelium (gm.)	Titre
0·5	3	1·49	50
1	3	1·91	100
2	3	1·54	240

By means of the differential assay, we have found that the type of penicillin formed in most cases was penicillin –X–.

A full account of these investigations will be published elsewhere.

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[1] Cook, R. P., Tulloch, W. J., Brown, M. B., and Brodie, J., *Biochem. J.*, **39**, 314 (1945).
[2] Cook, R. P., and Brown, M. B., *Proc. Roy. Soc. Edin.*, B, in the press (1947).

Australopithecinæ or Dartians

WHEN Prof. Raymond Dart, of the University of the Witwatersrand, Johannesburg, announced in *Nature*[1] the discovery of a juvenile *Australopithecus* and claimed for it a human kinship, I was one of those who took the point of view that when the adult form was discovered it would prove to be near akin to the living African anthropoids—the gorilla and chimpanzee[2]. Like Prof. Le Gros Clark[3], I am now convinced, on the evidence submitted by Dr. Robert Broom[4], that Prof. Dart was right and that I was wrong; the Australopithecinæ are in or near the line which culminated in the human form. My only complaint now is the length of the name which the extinct anthropoid of South Africa must for ever bear. Seeing that Prof. Dart not only discovered them but also rightly perceived their true nature, I have ventured, when writing of the Australopithecinæ, to give them the colloquial name of 'Dartians', thereby saving much expenditure of ink and of print. The Dartians are ground-living anthropoids, human in posture, gait and dentition, but still anthropoid in facial physiognomy and in size of brain. It is much easier to say there was a 'Dartian' phase in man's evolution than to speak of one which was 'australopithecine'.

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Downe, Kent.
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[1] *Nature*, **115**, 195 (1925).
[2] *Nature*, **115**, 234 (1925).
[3] *Nature*, **159**, 216 (1947).
[4] "The South African Fossil Ape-Men: The Australopithecinæ" (1946).