male skin graft rejection in a range of 12–91 (mean 45) days, having been in the second set in a range of 14–26 days. These last values correspond almost completely to the male first set skin graft rejection time obtained in B.C.G. infected *C57BL* female mice in the experiment performed by Balner *et al.*

From these results it can be deduced that the course and intensity of an immune reaction might be markedly dependent not only on antigenic differences but also on the functional status of the reticulo-endothelial system.

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Fixation of Atmospheric Nitrogen by Root Nodules of *Comptonia peregrina*

Comptonia peregrina (L.) Coult. is a common shrub in the eastern part of North America. It is an important component in the shrub layer of the Pinetum banksianæ[1]. *Comptonia peregrina* and its variety *C. p. asplenifolia* (L.) Fern. have root nodules[2]. The structure of these has already been described[3].

In view of the similarity in structure between the nodules of *Comptonia* and those of *Myrica*, it was probable that the nodules of the former, like those of the latter[4], can fix atmospheric nitrogen. To prove this, the ability of *Comptonia* nodules to fix nitrogen-15 was investigated.

The test material used consisted of: (*a*) Parts of roots with nodules and with adhering soil particles, taken 2 h before the beginning of the experiment at the Botanical Garden, Munich. The root parts were placed in a glass-holder containing at the bottom a small layer of water (about 5 mm deep); (*b*) Parts of roots as in (*a*), but embedded in moist soil; (*c*) Parts of roots with nodules, collected 24 h before the experiment from the Botanical Garden, Darmstadt. During the experiment they were embedded in moist soil; (*d*) Moist soil, sampled in the rhizosphere of *Comptonia*, at prevailing soil moisture conditions; (*e*) As in (*d*), but after full water-saturation of the soil.

The material was transferred into a 'circulation system'[5], evacuated three times at 30 mm mercury and filled intermittently with argon with the purpose of expelling air. A gas mixture containing about 30 vol. per cent nitrogen and 20 vol. per cent oxygen in argon (with a nitrogen-15 content of 16·23 atomic per cent ± 0·068) was then introduced in the system. After six days the experiment was stopped. The nodules (with the adhering soil particles) were detached from the roots and the roots and nodules separately dried at 75° C in a vacuum oven. The soil, without roots and nodules, was dried at 105° C. Then the material was ground, the total nitrogen sampled by the Kjeldahl method, and the nitrogen-15 content determined with the aid of a mass-spectrograph (Atlas, CH_3/IS IV)[6]. The limit of the isotope-method used lies within an increase in nitrogen content of 0·01 per cent of the original amount.

Table 1 shows that fresh nodules (material *a* and *b*) fixed a remarkable amount of atmospheric nitrogen compared with the moderate increase in nitrogen content of the nodule-bearing roots. The soil showed very little or no increase in nitrogen content. The gain in nitrogen by the roots could be explained by the fact that they derived their additional nitrogen from the nodules. Nitrogen fixation by the soil-embedded root nodules (material *b*) was far more effective than that of material exposed to moist air (*a*).

Table 1

Material		Nitrogen content (% dry weight)	Nitrogen increase (% of original N)
a	Nodules	1·897	0·151
a	Roots	1·623	0·015
b	Nodules	2·597	2·224
b	Roots	1·702	0·578
b	Soil	0·354	0·013
c	Nodules	2·098	0·000
c	Roots	1·475	0·000
c	Soil	0·384	0·011
d	Soil	0·348	0·020
e	Soil	0·362	0·000

A greater elapse of time between collection and experimentation (material *c*) leads to a complete loss of the ability to fix nitrogen. It is possible also that the active nodules (material *a* and *b*) fix nitrogen only during the first phase of the 6-day experimental period.

These results confirm that root nodules of *Comptonia* can fix atmospheric nitrogen. A quantitative evaluation of the fixation capacity of intact plants cannot be derived from the results of the present experiment. Results previously obtained by Stewart[7] with *Alnus* would suggest that this capacity would be greater than that of isolated root parts.

In view of our results it is quite probable that *Comptonia peregrina* plays an important part in the nitrogen status of soils in the natural area of the species in North America.

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Infection of Celery Seedlings by Viable Spores of *Septoria* spp.

Blight of celery caused by *Septoria* spp. was first definitely recognized in England in 1906 and afterwards was reported to spread rapidly over the country[1]. As early as 1910 it was known that the pycnidia of the fungus on the 'seed' contained spores which produced the disease when they were suspended in water and sprayed on to plants.

Chittenden[1], writing in 1914–15, gives reasons for suspecting that the seed was "the principal if not the only source of infection", and he claims to have been able to demonstrate infection of seedlings when infected seed was "sown in the ordinary way". Since then it has been commonly assumed that spores from pycnidia on the seed