months. We used a special thermostat, which will be before long described. The temperature was determined by means of a BECKMANN thermometer. It remained constant within some thousandths of a degree.

The results are shown in Table I.

TABLE I.
Temperature 25°.00.

Time in hours	Level of the meniscus (mm.)
0	526
1/3	425
2 2/3	252
4 2/3	219
11 2/3	181

A strongly marked contraction at *constant* temperature occurs.

5. As the metal contains a certain amount of zinc oxide in consequence of its fine state of division, the question might arise whether the contraction observed may be attributed to some chemical reaction between the oxide and the paraffin oil.

In order to investigate this point more closely we filled a dilatometer (100 cc.) with zinc oxide and the same paraffin oil we had used in the experiment described above. After having evacuated it at the GAEDE pump we put it into a thermostat at 25°.00. The meniscus did not show any charge in 24 hours. The contraction observed in our first experiment has consequently to be attributed to a change in the metal. We intend continuing our investigations on the different modifications of zinc present in the "atomized" metal.

Utrecht, April 1914. VAN 'T HOFF-*Laboratory.*

Chemistry. — *"The allotropy of Copper".* II. By Prof ERNST COHEN and W. D. HELDERMAN.

1. We have also continued our investigations on the allotropy of copper in the direction indicated in our second paper on the allotropy of cadmium.

The dilatometer had shown (§ 4 of our first paper) that there is a transition point at 71°.4. We used the same method described in our second communication on cadmium in order to determine if this point changes by a change in the previous thermal history of the metal.

2. The sample the transition point of which had been fixed at 71°.7 (§ 6 of our first paper) had not been treated with an electrolyte. It was removed from the dilatometer, washed with ether and kept in contact for some days with a solution of copper sulphate. This material (Cu_{II}) then gave the following results:

TABLE I.

Temperature.	Duration of measurements in hours	Rise of level in mm.	Rise of level in mm. per hour
61°.7	1/6	— 78	— 468
74.6	1/6	+225	+1350
69.6	1/4	— 38	— 152
72.1	1/6	+ 67	+ 402
70.3	1	— 38	— 38
71.6	2/3	+ 84	+ 126
70.8	1/2	+ 13 1/2	+ 27
70.6	1 1/6	— 10	— 8 1/2
70.7	5 1/6	+ 36	+ 7

The transition point has thus been altered from 71°.7 to 70°.65.

3. As far as the measurements we carried out with samples of very different previous thermal history are concerned, we only mention here that we found as upper limit of the transition temperature 71°.7, as lower one 69°.2. [1])

4. We merely give here some details concerning a sample (Cu_{III}) which had been made by mixing a certain weight of Cu_{II} (Transition point 70°.65) with an equal quantity of the original material (Kupfer-KAHLBAUM, Elektrolyt, geraspelt), which as we were told when purchasing it, had been melted after electrolysis. Cu_{III} had been at 50° for 10 days and nights in contact with paraffin oil. The results are given in table II.

[1]) The description of our experiments will be given in full in our paper in the Zeitschr. f. physik. Chem.

TABLE II.

Temperature.	Duration of measurements	Rise of level in mm.	Rise of level in mm. per hour
68°.0	$2^1/_3$	— 15	— 6
75.0	$1^1/_2$	+ 46	+ 30
72.0	$^5/_6$	+ 14	+ 17
70.0	$5^1/_4$	+ 10	+ 2
69 5	58	+243	+ 4
69.5	31	— 36	— 1

At *constant* temperature (69°.5) the direction of motion of the meniscus has changed. This change proves that also in this case there are more than two modifications present at the same time.

5. How extraordinarily marked the retardations are which may occur, is shown by the behaviour of a sample Cu_{IV} (comp. § 7 of our first paper); it was not possible to "bring it into motion" even after treating it with a solution of copper sulphate. However, it ought to be pointed out that there was no finely divided powder present, which was the case with the other samples we investigated.

Utrecht, April 1914. VAN 'T HOFF-*Laboratory.*

Botany. — *"Energy transformations during the germination of wheat-grains".* By LUCIE C. DOYER. (Communicated by Prof. F. A. F. C. WENT).

(Communicated in the meeting of April 24, 1914).

The reserve materials of seeds represent a large quantity of chemical energy. In germination these substances are split into compounds with a much smaller number of atoms and partly by the process of respiration completely oxydized to carbon dioxide. In consequence of these exothermic processes a considerable quantity of energy is set free, which can be used for the various vital-processes.

In order to obtain a conception of these transformations of energy during germination, I have made some observations on germinating