null-method COMPTON and ROGNLEY [1]) have actually established the absence of any such effect for the (ferro-magnetic) crystals of magnetite.

2. In the theory of LANGEVIN-WEISS the rotational movement of the elementary magnets gives its own contribution to the kinetic energy and therefore to the specific heat, whereas in our theory the corresponding term does not occur. At first sight this appears strange, since the form of equation (2) seems to point to equipartition. But a similar result will always be obtained, in cases, where the lowest quantum-motions which are possible, possess a very small difference of energy $\Delta\varepsilon$ with respect to each other (in our case $2\mu H\cos\vartheta$ with a field H). In those cases there is always a range of temperatures T, where T is small enough for the higher quantum-orbits to be disregarded, and at the same time large enough with respect to $\Delta\varepsilon$.

3. Although the transition between the right- and left-hand motions requires an amount of energy small as compared to rT, still it may require the coincidence of favourable circumstances to bring about the corresponding reversal of the motion (moment of momentum). Since we are dealing with a quantic process, it is probably difficult to treat this question quantitatively. In general we may expect, that the corresponding retardations in the establishment of the magnetisation would show themselves most easily at very low temperatures and rapidly alternating fields [2]). (For light-vibrations χ is always $= 0$). They would for instance give rise to a kind of hysteresis and a corresponding development of heat, when gadolinium-sulphate is periodically magnetized in opposite directions.

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[1]) A. H. COMPTON and O. ROGNLEY. Is the atom the ultimate magnetic particle? Phys. Review. **16** (1920) 464.

[2]) The possibility of this retardation was pointed out by LENZ in his address at Nauheim (l.c. p. 615) from the point of view of the sudden reversals of the magnetic atoms. Previously to this in the beginning of July 1920 the question was discussed by Prof. KAMERLINGH ONNES and me, both from the point of view of WEISS' theory and of the assumptions ol this paper, together with the possibility of testing it experimentally.

Palaeontology. — *"The identity of the genera Poloniella and Kloedenella."* By Miss J. E. VAN VEEN. (Communicated by Prof. J. W. MOLL.)

(Communicated at the meeting of December 18, 1920).

In the year 1896 a treatise appeared by Prof. Dr. GÜRICH about the Palaeozoïcum of the Polish middle mountain range. In this treatise the author instituted the new genus *Poloniella* (4, p. 388) for a few carapaces and valves of formerly unknown Ostracoda, originating from the middle devonian Ostracoda marl of Dombrowa near Kielce. These remains he united into one species viz. *Poloniella devonica*.

Some twelve years afterwards the two American palaeonotologists Dr. ULRICH and Dr. BASSLER supplied a contribution to the knowledge of the *Beyrichiidae*. On this occasion the new genus *Kloedenella* (8, p. 317) was founded also, under which group they intended to bring together eight species at the least.

In 1914 Prof. Dr. BONNEMA (2, p. 1087; 3, p. 1105) was able to amplify the characteristics of the genus *Kloedenella* as given by ULRICH and BASSLER as a result of his investigation into the nature of the Ostracod, which Dr. AUREL KRAUSE formerly described under the name *Beyrichia hieroglyphica*.

In comparing what the above mentioned authors have said about the genera *Poloniella* and *Kloedenella*, it is obvious that the latter are identical. It should however be observed that what BONNEMA takes to be the anterior part of the carapace — and rightly in my opinion — is considered the posterior part by the others. As a natural result the valve, which is the left one, according to BONNEMA, is called the right one by the others.

Thus BONNEMA found as the most characteristic feature of the genus *Kloedenella* that the right valve before the straight part of the hinge line has a notch in which a process of the left valve fits. (fig. 3).

In the genus *Poloniella* a similar connection of the valves seems to be present. GÜRICH does not mention this fact emphatically, but as he writes: "Ganz am vorderen Ende jedoch tritt der linke Saum wieder zurück und auf der hinteren Kantenhälfte springt der rechte Saum sogar stark über", I should conclude from this that it occurs here also.

Besides BONNEMA had found that in the genus *Kloedenella* the right valve overlaps the left one at the hinge line, whereas the opposite is the case with the free edges. In accordance herewith, GÜRICH writes ".... greift am Schlossrande die linke Klappe in einer gradlinigen Leiste vorspringend über den entsprechenden Rand

der rechten Klappe" and "Längs des Bauch-, Vorder- und Hinterrandes greift die rechte Klappe über . . . ."

The identity of the two genera, however, appears much more clearly from the figures GÜRICH gives of his *Poloniella devonica* and BONNEMA of *Kloedenella hieroglyphica* and which are partly copied on the accompanying plate. If we compare Fig. 1 of *Poloniella devonica* with Fig. 2 of *Kloedenella hieroglyphica* and Fig. 7 of the former with Fig. 8 of the latter, it appears that also of the former the right valve has undoubtedly a notch in which a process of the left valve fits. The fact that GÜRICH represents complete carapaces of *Poloniella devonica* and loose valves of the other Ostracoda, originating from the same locality, renders it also probable that in *Poloniella* the connection of valves is present, which is characteristic of the genus *Kloedenella*.

At the same time it is easy to see that the furrows on the lateral sides of the carapaces of the Ostracoda correspond, when we only assume that in *Poloniella devonica* the anterior and the posterior furrows are joined at the ventral side, so that we cannot distinguish here the two small furrows that are present in *Kloedenella hieroglyphica*.

If we compare the figures 7 and 9 of *Poloniella devonica* which were given by GÜRICH, it strikes us immediately that the carapaces illustrated are very different in thickness. This is easily explained by assuming that the first comes of a male and the second of a female individual, as has occurred in many other Ostracoda. (1, p. 79; 7, p. 66). The carapace of the female is taken to be thicker than that of the male as a result of the stronger development of the genital apparatus.

The same phenomenon appears also in *Kloedenella hieroglyphica*. Among the material of this Ostracod, which is to be found in the Mineralogical-geological Institute at Groningen, occur two kinds of carapaces viz. thick ones which I think originating from females (Fig. 10) and less thick ones originating from males (Fig. 8).

Thus we can see that in both genera *Poloniella* and *Kloedenella* sexual dimorphism appears in the same manner.

I, therefore, do not doubt the identity of the genera *Poloniella* and *Kloedenella*. The former being founded before the latter, the genus *Kloedenella* must be abandoned.

The criteria of the genus *Poloniella* are: carapace elongate and small; the length usually less than 1½ mm.; the thickness of the carapace of the male individuals practically everywhere the same; in the female much larger especially at the posterior end. At the anterior and posterior ends the carapace is equal in height with the

males; with the females the posterior part is higher. The dorsal edge straight; the ventral one convex or somewhat concave. The anterior edge equally curved and passing almost unperceptibly into the dorsal edge, as together with it a very obtuse angle is formed; the posterior edge less curved and forming almost a right angle with the dorsal edge. Valves unequal; the right one on the anterior part with a half circular notch, in which a process of the left valve fits. Owing to this peculiar connection of the valves complete carapaces have generally been preserved. The sharp hinge line of the left valve lies in a furrow on the hinge line of the right valve, the latter being higher than the left one along the hinge line. The sharp free edges of the right valve lie in a furrow on the free edges of the left, so that with the free edges the left valve overlaps the right one. The surface of the carapaces is different. On the anterior part of each valve two more or less vertical furrows are found that are separated by a narrow lobe. Also on the posterior part a furrow may occur which can be linked to the anterior furrow below. For the rest the surface is generally smooth and without ornamental markings.

Remains of these Ostracoda have been found in upper silurian, devonian and probably also in carboniferous strata of the temperate zones of the Northern Hemisphere.

In the foregoing we have seen that *Poloniella devonica* can easily be derived from the upper silurian *Poloniella hieroglyphica* by assuming that the two small furrows which are found below the middle of the three larger ones, are joined together and with the anterior and posterior furrow, through the disappearance of the intermediate lobes.

Poloniella hieroplyphica is sure to have found its origin in a species of this genus which resembled to a degree the older but yet upper silurian *Poloniella Hallii* JONES sp. (Fig. 12) (5, p. 15). Here the two small furrows are wanting, but the three larger ones are already well developed. The occurrence of valves with one small furrow in *Poloniella hieroglyphica* points to this fact also (Fig. 6).

The forms resembling *Poloniella Hallii* can be easily derived from the type represented by *Poloniella pennsylvanica* (Fig. 13) (6 p. 341) which occurs in under-devonian deposits and where no more than two vertical furrows are present.

Finally I give my best thanks to Prof. Dr. J. H. BONNEMA for kindly putting the material of *Poloniella hieroglyphica* at my disposal, and to Miss A. J. POTT, who has been so obliging as to make the necessary drawings.

Mineral.-Geol. Inst. University at Groningen.

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EXPLANATION OF THE PLATE.

Fig. 1. Carapace of *Poloniella devonica* G. GÜRICH seen from the right side. (After GÜRICH).

Fig. 2. Carapace of *Poloniella hieroglyphica* A. KRAUSE sp. seen from the right side 40 ×. (After BONNEMA).

Fig. 3. Right valve of *Poloniella hieroglyphica* A. KRAUSE sp. 40 ×.

Fig. 4. Carapace of *Poloniella devonica* G. GÜRICH seen from the left side. (After GÜRICH).

Fig. 5. Carapace of *Poloniella hieroglyphica* A. KRAUSE sp. seen from the left side. 40 ×. (After BONNEMA).

Fig. 6. Left valve of *Poloniella hieroglyphica* A. KRAUSE sp. 40 ×.

Fig. 7. Carapace of *Poloniella devonica* G. GÜRICH of a male individual seen from the dorsal side. (After GÜRICH).

Fig. 8. Carapace of *Poloniella hieroglyphica* A. KRAUSE sp. of a male individual seen from the dorsal side. 40 ×. (After BONNEMA).

Fig. 9. Carapace of *Poloniella devonica* G. GÜRICH of a female individual seen from the ventral side. (After GÜRICH).

Fig. 10. Carapace of *Poloniella hieroglyphica* A. KRAUSE sp. of a female individual seen from the dorsal side. 40 ×.

Fig. 11. Transverse section at the height of the muscle impression of a carapace of *Poloniella hieroglyphica* A. KRAUSE sp. seen from the posterior end. 35 ×. (After BONNEMA).

Fig. 12. Left valve of *Poloniella Hallii* JONES. sp. 15 ×. (After JONES).

Fig. 13. Carapace of *Poloniella pennsylvanica* JONES sp. seen from the right side, from the anterior end and from the ventral edge. 15 × (After JONES).

Fig. 1.

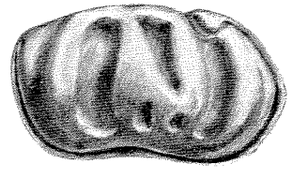

Fig. 2.

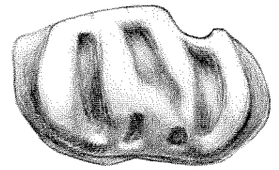

Fig. 3.

Fig. 4.

Fig. 5.

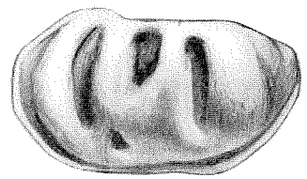

Fig. 6.

Fig. 7.

Fig. 8.

Fig. 9.

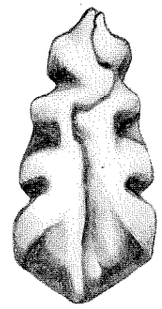

Fig. 10.

Fig. 11.

Fig. 12.

Fig. 13.