# Reply

## to the press release of the Naturkundemuseum (Museum of Natural History), Berlin (Dr. Gesine Steiner) - November 21, 2006

The Chiemgau Impact Research Team (CIRT) has read the press release of the Naturkundemuseum (Museum of Natural History) in Berlin (Dr. Gesine Steiner; http://download.naturkundemuseum-berlin.de/presse/Chiemgau.pdf) carefully and with great interest.

We appreciate this publication of the minds of a group of national and international scientists and their speaker Uwe Reimold, a professor of mineralogy at the Naturkundemuseum and taking responsibility. By this press release we see a first step to a sound discussion of the issues raised by our research.

Within the academic circle of colleagues, we act on the assumption that the subject to be examined and verified as well as the scientific methodology are paramount in a creative dispute.

In this context we criticize first of all the carelessness of releasing a press statement referring to an incorrect address of our website. Addressees of the press release who are working scientifically and who are interested to evaluate the presented statements with respect to the results of the latest research so far obtained, discussed and authorized by the CIRT (www.chiemgau-impact.com, www.chiemgau-impakt.de), may be put off.

In an e-mail (November 23, 2006) to the press office responsible of the release, we asked for an error correction.

Formally we state that the press release combines popular TV and press adaptations of our research with partial information taken from our website. The press release mostly ignores our research to date that is at all times and worldwide accessible in the Internet on our website where we publish in great detail and also in English. The press release also ignores that on our website we distanced ourselves from false and falsified popular presentations in the press and in the TV.

In the press release, the group of signing scientists invokes the exaggerated presentation in public media (press, TV) and in the discussion of an international scientific e-mail network (CCNet). Obviously, the group around Prof. Reimold is regarding these distribution organs as serious sources for scientifically correct information. We therefore emphasize that only authorized views and versions on the web page www.chiemgau-impact.com (www.chiemgau-impakt.de) can be the subject of a scientific dispute. Incidentally, we point to the contributions presented by us and other scientists and since two years published in relevant scientific organs (see the list of references below). We also note that on our web page we present a clear scientific methodology with reference to empirical research, analysis, formation of hypotheses, and discussion of the in each case obtained results. Moreover, we have published revisions whenever they were necessary in the course of the research progress. Therefore, the classification of our website in the press release as "popular scientific" can only be regarded as a trick to define research by the authority of a few peer-reviewed scientific journals. The forgery affair of the Southern Korean clone

researcher Hwang Woo Suk in the reputable SCIENCE journal at the 2005/2006 turn of the year has demonstrated how problematic the peer-review "trick" is.

Up to now, the signers of the press release have avoided the direct dispute of the results of our latest research step by step and on the basis of a counter-model (e.g., by the glaciological interpretation of all the relevant findings and results shown and discussed in authorized contributions on our website). A respective reference cannot be found in the press release either. Instead we are amazed to read a source (entitled *Langenhorst, F., Deutsch, A. (1996): The Azuara and Rubielos structures, Spain: Twin impact craters or Alpine thrust systems? TEM investigations on deformed quartz disprove shock origin. Lunar and Planetary Science XXVII, 725-726.)* that is referred to neither in the German nor in the more extensive English statement.

These clear formal shortcomings of the press release statement suggest the authors evade an objective, scientifically sound dispute and instead try to force sweeping beliefs. On this note we understand the mixture of hypothetically postulated models and checkable material results as conducted by the group around Prof. Reimold. On our web page, both hypothetical model and hard facts are clearly kept apart.

In the press release we are astonished to note that research results of the Prof. Th. Fehr group (*Fehr, K.T., Pohl, J., Mayer, W., Hochleitner, R., Fassbinder, J., Geiss, E., Kerscher, H., 2005: A meteorite impact crater field in eastern Bavaria? A preliminary report. Meteoritics and Planetary Science 40,187-194*) selectively gain frank support. Here, we expect scientific correctness that means to consider and specify also published results of other research teams (see the list below) that came to similar conclusions, as did we, about the peculiar craterform structures in the Altötting region and at Lake Tüttensee.

In connexion with this press release statement we realize that the hypothesis of an impact in historical times (and in the today's Germany) challenges the scientific community evidently confirming the idea's virulence. With regard to this virulence, we miss however that not any one of the signers took an active part in our excavation campaigns in order to catch up on the results on-site. Geologically speaking, a "superficial" view could simply have been avoided and replaced by deeper insight. We point to the fact that a couple of national and international colleagues from various disciplines followed our invitation to get a picture on-site and to take samples for own revisions from the viewpoint of their particular fields. In our opinion, remote diagnostics setting aside own on-site studies cannot be considered an actual scientific contribution to the discussion.

Furthermore and with regard to the origin of the craterform structures in the Altötting and Tüttensee regions, we miss in the press release the generally accepted scientific procedure of verification and falsification. In our opinion, the categorical statement *„Overwhelming scientific evidence suggests …“* without any detailed substantiation of a terrestrial, especially glacial interpretation, does not at all give any answer. We call on the critics to explain the settings and findings listed below, on the basis of geological processes well known in the region under discussion and thus if applicable to disprove our interpretation.

Therefore and as a first access to the virtual scientific discussion, we take the liberty of posing the following questions and, apart from press statements, requesting you to answer. This should be done in detail and in full, and with supporting documents, without recourse to our impact hypothesis.

## *We request explanation:*

**Findings:**

In about 20 excavation pits around Lake Tüttensee we encounter a situation exhibiting the following geological setting:

1. At 1 - 2 m depth (depending on the topographic situation) an undisturbed Pleistocene or Holocene rock representing a pure lacustrine clay of the previously larger Lake Chiemsee or well-known loamy gravel composed of well-rounded cobbles of Alpine lithologies.

2. Over that, a decimeter thick horizon representing a fossil soil over lacustrine clay or loamy gravel. This fossil soil horizon contains excellently preserved organic material in the form of wood, fresh blades of reed and tufts of animal and/or human hair. Pushed in this fossil horizon we find heavily shattered however coherent clasts of quartzite, limestone, dolostone and crystalline rocks.

3. This fossil soil horizon is overlaid by an up to one meter thick polymictic breccia that in part exhibits the same facies as shows the Bunte breccia of the Nördlinger Ries impact structure. The Tüttensee Bunte breccia contains multicolored sharp-edged rock fragments representing a complete grain size spectrum from Alpine lithologies. The Bunte breccia is rich in organic material in the form of fragmented wood, charcoal, bones, bone fragments and well-preserved animal teeth. The Tüttensee Bunte breccia contains brecciated clasts exhibiting grit brecciation and mortar texture and the peculiarity that the clasts in spite of strongest smashing are encountered coherent in the clayey matrix.

Clasts of all lithologies (thus also silicate rocks like sandstones or amphibolites) from the Tüttensee Bunte breccia show an extremely deep-reaching corrosion to the point of residual rock skeletons. A rock dissolution due to acid soils as proposed by the *Bayerisches Landesamt für Umwelt, München*, contradicts the fact that the rock skeletons are regularly component part of a rock (namely the Bunte breccia) and are not found in the soil, neither in fossil nor in recent soil.

4. The Tüttensee Bunte breccia is overlaid either by a fresh, probably Holocene gravel layer of completely untouched cobbles and recent soil formation, or immediately by recent soil.

**Our interpretation:**

The geological setting as presented can without constraint (!) be explained by well-known impact cratering processes (Melosh, H.J. 1989. *Impact cratering. A geologic process*. Oxford Univ. Press, Oxford, 245 pp.). At the time of the impact some 2500

years ago, the target is made up of lacustrine clay of Lake Chiemsee and Pleistocene and/or Holocene banks of loamy gravel including a (nowadays fossil) soil with organic material (wood, reed, tufts of hair possibly from a bird's nest). On excavation of the impact-induced growing Tüttensee crater, ejecta are forming the rim wall of the Tüttensee, and a blanket of crushed rock material extends over the soil. Since the crater-forming process acts catastrophically, the organic matter in the soil is supposed to have rapidly been blanketed and thus to have become oxygen sealed enabling the fantastic preservation until today.

The heavily crushed however completely coherent clasts within the soft clayey breccia matrix is explained by high confining pressure having acted on excavation and landing of ejecta well known from many impact structures all over the world. The deep-reaching skeletal corrosion of many clasts is explained by decarbonization/melting and/or nitric-acid dissolution of carbonate rocks (limestones, dolostones) and by nitric-acid corrosion of silicate rocks.

Finally, younger flooding has buried the Tüttensee Bunte breccia ejecta by gravel layers of untouched cobbles, and in part the recent soil has formed immediately over the breccia horizon.

**Using the example of the Tüttensee crater, we request from the signers of the press release denying the Chiemgau impact:**

1. How do you explain the formation of the post-glacial rock layer of the multicolored breccia (Tüttensee Bunte breccia) that according to radiocarbon dating (CEDAD Università di Lecce 2006) is definitely younger than 2,500 B.C. ?

2. How do you explain the completely crushed clasts of competent Alpine rocks that nevertheless exhibit absolute coherence within the breccia and pushed-in in the fossil soil? Grit brecciation and mortar texture in dolomites and quartzites require that the compressive strength of the order of 1 - 3 kbar was exceeded corresponding hydrostatically with 3 - 9 km rock load (respectively, 10 - 30 km ice load) - the latter numbers in case a Pleistocene ice load is introduced to argumentation.

3. If you nevertheless suggest the rock crushing originates from tectonics in the Alps, perhaps even under minor pressure, please explain the physical processes having enabled the shattered but coherent clasts to have survived a transport from the Alps to the Tüttensee area.

If you are arguing for frost shattering (in 1 - 2m depth!) of the clasts within the Bunte breccia, please explain how it is possible that large quantities of sharp-edged rock fragments are encountered isolated within the breccia matrix while the frost-shattered(?) adjoining neighbors do not exist.

4. We would willingly discuss a giant landslide having produced the extensive breccia layer - however, where is the relief needed and where is the source for the deposited brecciated rock material? On examination of excavations at some distance, the Bunte breccia layer has disappeared.

5. How do you explain the absolutely fresh conservation of reed and hair in a fossil soil horizon at 1 - 2 m depth?

6. How do you explain the deep-reaching rock dissolution and rock corrosion culminating in residual rock skeletons within the Bunte breccia?

7. Do you subscribe the opinion of the *Bayerisches Landesamt für Umwelt, München,* that the skeletal corrosion can be explained by acid soil dissolution - and if you believe that: Are you able to in detail elucidate the processes to run off?

8. Where in the Alpine foreland or elsewhere in the world does a comparable geological setting implying comparable deformations and rock modifications exist, and, if any, what is the explanation there?

9. How do you justify the categorical denial of the shock effects in rocks from the Tüttensee rim wall and from the Tüttensee ejecta (Bunte breccia) layer presented on www.chiemgau-impact.com and www.chiemgau-impakt.de? What enables you to evaluate without microscope (optical, electron) our presented shock effects (e.g., up to five sets of PDFs per quartz grain) to be no shock effects?

10. Do you justify the denial of our shock effects with regard to in individual cases slightly curved lamellae (as seen in one of our images) that are classified as nontypical of shock in publications by, e.g., Koeberl and Reimold (e.g., *Reimold, W.U. & Koeberl, C. (2000): Critical Comment on: A.J. Mory et al. 'Woodleigh, Carnavon Basin, Western Australia: A New 120 km Diameter Impact Structure', EPSL v. 184, pp. 353-357*) . If this applies: How do you deal with the paper published by Trepmann & Spray (LPSC XXXV, 2004), where significantly curved PDFs in quartz are related to plastic deformation of the crystal?

Looking forward to an exciting and objective dispute at a high scientific level,
and sincere regards to our colleagues,

CIRT

## Scientific publications (2004 - 2006) on the Chiemgau impact

### 2004

Hoffmann, V., Rösler, W., Schibler, l. (2004): Geophys. Res. Abstracts, 6, 05041.

Hoffmann et al. (2004): Evidence for an impact strewn field in SE Bavaria. Paneth-Kolloquium, Nördlingen.

Raeymaekers, B. & Schryvers, D. (2004): Iron silicides and other metallic species in the SE Bavarian strewn field). Paneth-Kolloquium Nördlingen.

Rappenglück et al. (2004): The Chiemgau impact event in the Celtic Period: evidence of a crater strewnfield and a cometary impactor containing presolar matter. http://www.chiemgau-impact.com/.

Rösler et al. (2004): Puzzling new carbon materials in forest soils: carbonaceous graphitic spherules (CGS) with diamonds. Paneth-Kolloquium, Nördlingen.
Schryvers, D. & Rössler, W. (2004): Diamond identification by TEM in carbonaceous graphitic sperules. Paneth-Kolloquium, Nördlingen.

**2005**

CIRT, Chiemgau Impact Research Team (2005): Kommentar zu: Der Tüttensee im Chiemgau - Toteiskessel statt Impaktkrater, von Gerhard Doppler und Erwin Geiss (Bayerisches Geologisches Landesamt). http://www.chiemgau-impact.com/kommentar.html.

Ernstson, K. (2005): Gravimetrische Untersuchungen bei Grabenstätt: Anzeichen für einen Impaktursprung des Tüttensee-Kraters erhärtet. http://www.chiemgau-impact.com/.

Fehr, K.T., Pohl, J., Mayer, W., Hochleitner, R., Faßbinder, J., Geiß, E., Kerscher, H. (2005): A meteorite impact crater field in eastern Bavaria? A preliminary report. Meteoritics and Planetary Science, 40, 187-194.

Hoffmann, V., Rösler, W., Patzelt, A., Raeymaekers, B., van Espen, P. (2005): Characterization of a small crater-like structure in southeast Bavaria, Germany. Meteoritics and Planetary Science, 40, p. A129.

Rappenglück et al. (2005): Sind die Eisensilizide aus dem Impakt-Kraterstreufeld im Chiemgau kosmisch? - Eur. J. Mineral. 17, Beih. 1: 108.

Raeymaekers, B. (2005): A Prospective Biomonitoring Campaign with Honey Bees in a District of Upper-Bavaria (Germany). - Environmental Monitoring and Assessment, Vol. 116, No. 1-3. (May 2006), pp. 233-243.

Rösler, W., Hoffmann, V., Raeymaekers, B., Schryvers, D., Popp, J. (2005): Diamonds in carbon spherules - evidence for a cosmic impact?. Meteoritics and Planetary Science, 40, p. A129.

Schryvers, D. and Raeymakers, B. (2005): EM characterisation of a potential meteorite sample, proceeding of EMC 2004, Vol. II, p. 859-860 (ed. D. Schryvers, J.P. Timmermans, G. Van Tendeloo).

Schüssler (2005): Petrographie und Geochemie von mechanisch und thermisch geschockten Geröllen aus dem nördlichen Bereich des Impakt-Areals. http://www.chiemgau-impact.com/petrographie.html.

Schüssler (2005): New analyses - new photomicrographs: xifengite, gupeiite and titanium carbide. http://www.chiemgau-impact.com/analysis.html.

Schüssler et al. (2005): Das Impakt-Kraterstreufeld im Chiemgau. - Eur. J. Mineral. 17, Beih. 1: 124.

**2006**

Rösler et al. (2006): Characterisation of a small craterlike structure in SE Bavaria, Germany. European Space Agency First International Conference on Impact Cratering in the Solar System. ESTEC, Noordwijk , The Netherlands, 812 May, 2006.

Rappenglück, B. und M. (2006): Does the myth of Phaethon reflect an impact? – Revising the fall of Phaethon and considering a possible relation to the Chiemgau Impact. Mediterranean Archaeology & Archaeometry (MAA), Vol.6, No.3 (2006), eingereicht im Juni 2006, akzeptiert (peer reviewed) und im Druck.