

March–April  
**2017**

# European Science Review



ISSN 2310-5577

Austria, Vienna

# **European science review**

**№ 3–4 2017**

**March–April**



«East West» Association for Advanced Studies and Higher Education GmbH

**Vienna  
2017**

# European Sciences review

Scientific journal

№ 3–4 2017 (March–April)

ISSN 2310-5577

## Editor-in-chief

Lucas Koening, Austria, Doctor of Economics

## International editorial board

Abdulkasimov Ali, Uzbekistan, Doctor of Geography  
Adieva Aynura Abduzhalolovna, Kyrgyzstan, Doctor of Economics  
Arabaev Cholponkul Isaevich, Kyrgyzstan, Doctor of Law  
Zagir V. Atayev, Russia, Ph.D. of Geographical Sciences  
Akhmedova Raziya Abdullayevna, Russia, Doctor of Philology  
Balabiev Kairat Rahimovich, Kazakhstan, Doctor of Law  
Barlybaeva Saule Hatsiyatovna, Kazakhstan, Doctor of History  
Bestugun Alexander Roldovich, Russia, Doctor of Engineering Sciences  
Boselin S.R. Prabhu, India, Doctor of Engineering Sciences  
Bondarenko Natalia Grigorievna, Russia, Doctor of Philosophy  
Bogolub Tatiana Maksimovna, Ukraine, Doctor of Economics  
Bulatbaeva Ayyul Abdunazhitovna, Kazakhstan, Doctor of Education  
Chikvaze George Bidzinaevich, Georgia, Doctor of Economics, Doctor of Law  
Dalibor M. Elezović, Serbia, Doctor of History  
Gurov Valery Nikolaevich, Russia, Doctor of Education  
Hajiyev Mahammad Shalibar oğlu, Azerbaijan, Doctor of Philosophy  
Ibragimova Liliya Ahmarjanovna, Russia, Doctor of Education  
Blahun Ivan Nemenovich, Ukraine, Doctor of Economics  
Ivannikov Ivan Andreevich, Russia, Doctor of Law  
Janaszayeva Rima, Kazakhstan, Doctor of Law  
Khubaev Georgy Nikolaevich, Russia, Doctor of Economics  
Khurtsidze Tamila Shalvovna, Georgia, Doctor of Law  
Khouryz Zaur, Russia, Doctor of Economics  
Khouty Irina, Russia, Doctor of Philology  
Korzh Marina Vladimirovna, Russia, Doctor of Economics

Kocherbaeva Aynura Anatolevna, Kyrgyzstan, Doctor of Economics  
Kushaliyev Kaisar Zhaitovich, Kazakhstan, Doctor of Veterinary Medicine  
Lekerova Gulsum, Kazakhstan, Doctor of Psychology  
Melnichuk Marina Vladimirovna, Russia, Doctor of Economics  
Meymanov Bakyt Kattoevich, Kyrgyzstan, Doctor of Economics  
Moldabek Kulakhmet, Kazakhstan, Doctor of Education  
Morozova Natalya Ivanovna, Russia, Doctor of Economics  
Moskvin Victor Anatolevich, Russia, Doctor of Psychology  
Nagiyev Polad Yusif, Azerbaijan, Ph.D. of Agricultural Sciences  
Naletova Natalia Yurevna, Russia, Doctor of Education  
Novikov Alexei, Russia, Doctor of Education  
Salaev Sanatbek Komiljanovich, Uzbekistan, Doctor of Economics  
Shadiev Ruzamat Davranovich, Uzbekistan, Doctor of Education  
Shahutova Zarema Zorilevna, Russia, Ph.D. of Education  
Seitanova Nazilya Bagir, Azerbaijan, Doctor of Philosophy (Ph.D. of History)  
Spasennikov Boris Aristarkhovich, Russia, Doctor of Law  
Spasennikov Boris Aristarkhovich, Russia, Doctor of Medicine  
Suleymanov Suleyman Fayrullaevich, Uzbekistan, Ph.D. of Medicine  
Suleymanova Rima, Russia, Doctor of History  
Tereschenko-Kaidan Liliya Vladimirovna, Ukraine, Doctor of Philosophy  
Tservadze Mzia Giglaevna, Georgia, Doctor of Philology  
Vijaykumar Muley, India, Doctor of Biological Sciences  
Yurova Kseniya Igorevna, Russia, Ph.D. of History  
Zhaplova Tariana Mikhaylovna, Russia, Doctor of Philology  
Zhdanovich Alexey Igorevich, Ukraine, Doctor of Medicine

## Proofreading

Kristin Theissen

## Cover design

Andreas Vogel

## Additional design

Stephan Friedman

## Editorial office

European Science Review "East West" Association for Advanced Studies and Higher Education GmbH, Am Gestade 1 1010 Vienna, Austria

## E-mail:

info@ew-a.org

## Homepage

www.ew-a.org

**European Science Review** is an international, German/English/Russian language, peer-reviewed journal. It is published bimonthly with circulation of 1000 copies.

The decisive criterion for accepting a manuscript for publication is scientific quality. All research articles published in this journal have undergone a rigorous peer review. Based on initial screening by the editors, each paper is anonymized and reviewed by at least two anonymous referees. Recommending the articles for publishing, the reviewers confirm that in their opinion the submitted article contains important or new scientific results.

East West Association GmbH is not responsible for the stylistic content of the article. The responsibility for the stylistic content lies on an author of an article.

## Instructions for authors

Full instructions for manuscript preparation and submission can be found through the "East West" Association GmbH home page at: <http://www.ew-a.org>.

## Material disclaimer

The opinions expressed in the conference proceedings do not necessarily reflect those of the «East West» Association for Advanced Studies and Higher Education GmbH, the editor, the editorial board, or the organization to which the authors are affiliated.

East West Association GmbH is not responsible for the stylistic content of the article. The responsibility for the stylistic content lies on an author of an article.

## Included to the open access repositories:



© «East West» Association for Advanced Studies and Higher Education GmbH

All rights reserved: no part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without prior written permission of the Publisher.

Typeset in Berlin by Ziegler Buchdruckerei, Linz, Austria.

Printed by «East West» Association for Advanced Studies and Higher Education GmbH, Vienna, Austria on acid-free paper.

<b>Section 9. Technical sciences</b> .....	<b>90</b>
<i>Alikulov Shukrat Sharofovich</i> Methods of technological processes' intensification of in situ leaching of uranium from low-penetrating ores.....	90
<i>Atabaev Farrukh Bakhtiyarovich</i> Waste from flotation enrichment of rocks — as a complex raw material for the cement industry.....	92
<i>Qasimov Huseyn Alakbar oğlu</i> Application of Rnd ( ) function in the process of question choice in electronic exams.....	94
<i>Zhalilov Rashid, Safarov Alisher Bekmurodovich</i> Increasing the reliability of the protection of electrical networks as a way to increase the reliability of power supply to consumers.....	97
<i>Ikramova Malika, Akhmedkhodjaeva Ifoda, Khodjiev Alisher</i> The Amudarya river basin water resources management issues: case study.....	99
<i>Sukhrob Telyaev Kudratillayevich, Iskandarov Asilbek Akrom ugli</i> Measurement of coefficient of convective heat transfer based on silicon oxide nanofluid in the cylindrical channel.....	102
<i>Ortikov Oybek</i> Designing clothing fabrics with defined porous.....	105
<i>Rasulov Hayat Zoirovich, Tashhodjaev A. U.</i> Depth of the diluted zone in the humidified loess bases under shaking conditions.....	107
<i>Rasulov Hayat Zoirovich, Tashhodjaev A. U., Rasulov S. A.</i> Change of depth of the diluted zone at concussion of water sated loess.....	109
<i>Tukhtakuziev Absusalim, Toshpulatov Bekzod</i> Substantiating the parameters of operating elements of the enhanced chisel-cultivator.....	111
<b>Section 10. Transport</b> .....	<b>113</b>
<i>Musadjanov Makhamadjan Zakirdjanovich, Musaev Doniyor Xabibullaevich,</i> <i>Mahkamov Mirjamol Yulchievich</i> Maintenance regimes of Mercedes-Benz buses, used in the conditions of Tashkent city.....	113
<b>Section 11. Physics</b> .....	<b>115</b>
<i>Barykin Gennady Mikhailovich</i> The properties of photon and electron. Part I.....	115
<b>Section 12. Chemistry</b> .....	<b>118</b>
<i>Shikhaliyev Kerem Seyfi, Salimova Nigar Azizaga</i> Thermodynamics and mutual distribution of macromolecules in the systems: chlorine- chlorocontaining polymers.....	118
<b>Section 13. Economics and management</b> .....	<b>120</b>
<i>Kucherova Iryna Mykolayivna</i> Ways of sustainable development of Ukraine in the conditions of current instability.....	120
<i>Temirkhanov Mutabar Juraevna</i> Improving the regulatory framework of financial accounting and reporting the tourist organizations of Uzbekistan.....	122
<i>Trinh Minh Tam</i> Technology absorption capability evaluation of small and medium enterprises in Vietnam: Conditions from the State and Enterprises.....	125

Rasulov Hayat Zoirovich,  
Tashkent Institute of Architecture and Construction,  
Doctor of Technical Sciences, Professor  
E-mail: hayat1941@mail.ru

Tashhodjaev A. U.,  
Tashkent Institute of Architecture and Construction,  
senior teacher

Rasulov S. A.,  
Tashkent Institute of Architecture and Construction,  
magistr,

## Change of depth of the diluted zone at concussion of water sated loess

**Abstract:** Article is devoted to questions of research on change of a diluted zone in the water sated loessial thicknesses in conditions of seismic fluctuations. To estimate a process depth of a diluted zone into thicknesses the formula serving a base for the factor of dynamic consolidation of a soil at concussion is proposed. The given factor testifies the speed of consolidation of the particles broken by concussion in each special case is subject to experimental definition. The final size deep a diluted zone depends on time of influence of concussions.

**Keywords:** dilution; concussion; water sated thickness; loessial soils; factor of dynamic consolidation; seismic pressure; dynamic pressure; plastic cohesion, internal friction.

In building practice the cases of subsidence, an inclination, and, sometimes the destructions of buildings and constructions at strong Earthquakes are quite frequent. As one of principal causes of occurrence of such phenomena serves diluted and the subsequent non-uniform a settle water sated soils (loess) lying in their basis.

Despite actions undertaken against diluted soils the analysis of consequences of Earthquakes last for many years and shows all increase in deformations of the constructions erected on water sated soils.

This circumstance testifies that the problem diluted weak soils in the conditions of concussion nevertheless remains actual.

It is known, that under diluted we mean difficult process proceeding in dynamic conditions connected with infringement of structure of a soil, pressure occurrence in pore water and transition in a suspension of particles and soil transition in a fluid condition. The substantiation of such rather difficult process including simultaneously many physical phenomena, is one of a difficult problems of soil mechanics.

Results of researches are more rarely stated in works of authors concerning change of a diluted zone in thickness of a fluctuating soil in the course of fluctuations.

It is known that occurrence diluted in a certain part of soil thickness will happen in cases when seismic pressure within this thickness will exceed the strength indicators of soil [1, P. 66–68]. Within the given part, which have received the names «diluted thickness» forms seismic deformations (seismic subsidence) constructions in the conditions of Earthquake.

The spent experimental researches with water sated loess soils at various fluctuations have shown, that the border of originally formed diluted thickness is not constant size, and changes in the course of concussion. One of principal causes of such phenomenon is served by gradual reduction of force of plastic cohesion between fluctuating particles and simultaneous influence on them of the dynamic pressures arising at consolidation of broken particles of a soil.

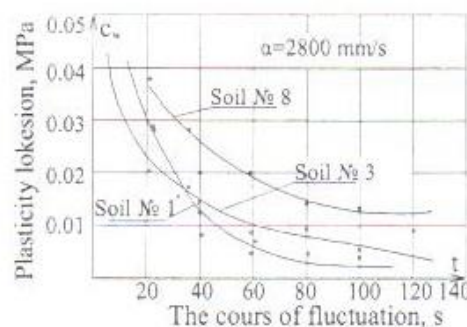


Figure 1. Change plasticity cohesion in the course of fluctuation

In the course of concussion of the water sated soil the change of a condition of a soil is observed, for example, from plastic in a fluid condition. Development of such phenomenon will last to definite time after which expiration there will be already rather longer proceeding return process accompanied by consolidation of particles. During this

process the gradual restoration of the broken plastic connectivity of a soil is also observed. This circumstance is well seen from fig. 1, where dependence of kind  $L_0 = f(L_c)$  for the investigated water sated loessial sandy loam is presented. On the following drawing the reduction of quantity of connectivity of a soil makes in the beginning concussions

4,5 during 80 times in conditions of fluctuation of a soil with acceleration of  $2800 \text{ mm/s}^2$ . The further concussion of a soil leads to attenuation of reduction of connectivity in considered conditions.

Based on results of the spent numerous researches it is possible to notice, that process of reduction of connectivity at concussion comes to the end on the average during 20–30 c. after the appendix of dynamic loading to a soil.

However, decrease in connectivity of a soil in the course of fluctuation in a number a case depends and on quantity of a dynamic pressure in water and filtration ability of a soil.

On fig. 2 the result of one of experiences of measurement of quantity of the dynamic pressures arising in a soil at its consolidation is illustrated. As noted in the schedule, the dynamic pressure\*

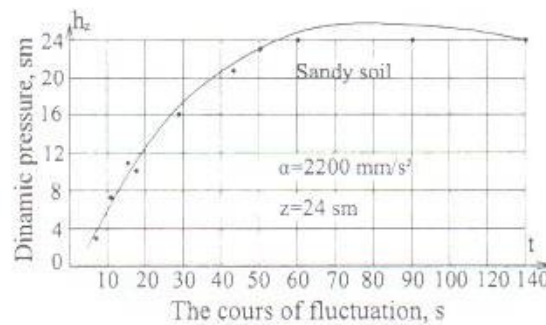


Figure 2. Character of change of a dynamic pressure in time

Reduction of durability of a soil as consequence of the above-named phenomena results entranced, in expansion of a diluted zone within thickness.

Studying thickness a diluted zone in the course of concussion makes a basis of the present research.

It is known, that the diluted zone always promotes reduction of durability and bearing ability of a soil. In cases, when durability of a soil decreases to a minimum (full diluted conditions) a loses soil a condition bearing ability and any loading on its surface will sink deep into thicknesses.

According to H. Z. Rasulov's theoretical work on "Conditioning of dynamic durability water sated loessial soils" the diluted plastic-cohesion of the humidified loess is a consequence of reduction of resistibility to shift of soil  $s_{zm}$  in result decrease cohesion ( $c_u$ ) and normal pressure from loading ( $\sigma$ ) [2, P. 79–84]. Reduction of normal pressure occurs for the account weighing influence of a dynamic pressure  $h_z$  arising in considered conditions.

This circumstance is represented in a kind:

a) resistibility of the water sated loess in static conditions:

$$s_{st} = (p_r + \gamma_w z) \text{tg} \varphi_w + c_w \quad (1)$$

b) same in dynamic conditions:

$$s_{dm} = [(p_r + \gamma_w z) - \gamma_w h_z] \text{tg} \varphi_w + c_w \quad (2)$$

For a case of absence of external loading on thickness of a soil:

$$s_{dm} = (\gamma_w z - \gamma_w h_z) \text{tg} \varphi_w + c_w \quad (3)$$

where:  $\sigma$  – normal pressure from weight of external loading;  $\gamma_w$  – soil density;  $z$  – considered horizon in soil thickness;  $\varphi_w$  – a corner of an internal friction of a soil;  $c_w$  – plastic cohesion between soil grains.

According to this formula we note the resistibility to shift of the water sated loess at concussion depends on quantity of change of cohesion of a soil and the dynamic pressure arising in a time of a soil at consolidation of particles which promotes decrease in influence of value of normal pressure. Thus the quantity of an operating dynamic pressure  $h_{z1}$  in any depth  $z$  is defined under the formula:

arising in soil water increases with 0 to certain quantity in the course of concussion. Time of increase of a dynamic pressure, according to comparison of indications, is approximately equaled time of decrease in connectivity of a soil.

Thus, it is possible to note the below-mentioned simultaneous processes proceeding at concussion of water sated loess:

- gradual decrease in quantity of plastic cohesion within thickness of a soil;
- occurrence of dynamic pressures and its increase in time as a result of consolidation of the weakened communications of particles;
- decrease the general durability of a fluctuating soil.

$$h_{z1} = \frac{v_w}{k_s} \left( Hz \cdot \frac{z^j}{2} \right) (e^{-\mu t} - e^{-\lambda t}), \quad (4)$$

where  $v_w$  – factor of the dynamic consolidation, testifying speed of consolidation of a soil;  $k_s$  – factor of a filtration of a soil;  $H$  – a thickness of a fluctuating soil;  $z$  – depth of considered horizon;  $\mu, \lambda$  – the dynamic factors defined by practical consideration.

Let's analyse formulas (4). It shows that the dynamic pressure resulting in a diluted condition of thickness mainly depends on value of factor dynamic consolidation  $v_w$ . This circumstance testifies that the speed of a filtration of superseded water depends on the direct image of the speed of soil particles consolidation. This shows that the more the quantity of factor of dynamic consolidation, the more volume superseded from a time of a soil of water. It in turn raises degrees diluted thicknesses, simultaneously unloading underlying layers of earth that promotes deep diluted zones in these conditions. On the basis told it is possible to notice, that expansion of a diluted zone in thicknesses also depends and on speed of consolidation of the destroyed particles of a soil.

The initial period of influence of concussions depending on dynamic durability of a soil in any part of thickness changes in a diluted condition ( $L_0$ ). The further process of fluctuations, on the basis of the above-stated, promotes deep this zone ( $L_1$ ), that it is possible to track by carrying out of simple dynamic experiences on vibrating installations. Unlike sand, in loessial soils the given process is tightened in time, cohesion of a soil corresponding for infringement.

For the most simple case including this process linear, the differential equation of change of a diluted zone in time it is possible to present in a kind:

$$dL_1 = v_w L_0(t) dt \quad (5)$$

where  $v_w$  – on former factor of dynamic consolidation, (1/c).

Integration of the equation (5) leads:

$$L_1 = A + C e^{-v_w t} \quad (6)$$

Constants of integration A and C are defined on conditions:

$$t = 0 \rightarrow L_1 = L_0$$

$$t = \infty \rightarrow L_s = H \quad (7)$$

From here

$$A = H; C = H - L_0 \quad (8)$$

Taking into account (7) and (8) the formula (6) it will be copied in a following definitive kind:

$$L_s = H - (H - L_0) - e^{-\alpha \cdot t} \quad (9)$$

Formula (9) once again confirms the conclusion stated earlier about dependence deep diluted thickness in the course of concussion from speed of consolidation ( $v_s$ ) a soil in these conditions.

According to results of our researches it is possible to notice, that the quantity of factor of the dynamic consolidation testifying the speed depends on many factors, most important of which are: conditions of initial density-humidity of a soil, value of plastic cohesion, coarse ground structure, and also intensity of concussion and character (on frequency and amplitude) this influence, etc.

At the same time for a substantiation of the difficult nature of factor  $v_s$ , special experimental researches and supervision are required.

#### References:

1. Ivanov P. L. Soils and the bases of hydraulic engineering constructions. – Moscow, – 1985. – 352 p.
2. Rasulov H. Z. Seismic stability of the soil bases, – Tashkent, – 1984. – 192 p.

DOI: <http://dx.doi.org/10.20534/ESR-17-3.4-111-112>

Tukhtakuziev Absusalim,  
 chief of the laboratory, Research scientific institute  
 of mechanization and electrification of agriculture,  
 doctor of technical sciences, professor  
 Toshpulatov Bekzod,  
 competitor-scientific employee research,  
 Research scientific institute of mechanization and electrification  
 of agriculture, (Republic of Uzbekistan)  
 E-mail: ax-stajyor@mail.ru

## Substantiating the parameters of operating elements of the enhanced chisel-cultivator

**Abstract:** The research results substantiating the parameters of loosening and arrow-typed claws are specified in the article. It is enhanced in a purpose to reduce the power-capability and increasing the quality of soil crushing by the chisel-cultivator.

**Keywords:** chisel-cultivator, operating elements, loosening claw, arrow-typed claw, chess-typed arrangement, track by track positioning, blocked-type cutting, free cutting, angle of incoming the loosening and arrow-typed claws into the soil, solution angle and seizure width of arrow-typed claw, energy costs, quality of soil crushing.

In conditions of our Republic the chisel-cultivators are the main technical means at pre-sowing soil tillage proceedings. However chisel-cultivators (CHK-3,0, CHKU-4 and others) being applied currently have higher power-capability, and by single running it often doesn't ensure the required quality in soil crushing. Pursuant to above we have developed the enhanced chisel-cultivator. It consists of framework with hang-up, supporting wheels and operating elements installed in three row onto the framework.

Differing from the existing ones the operating elements of the first and second row of developed chisel-cultivator are installed on the frame as rows at staggered sequence, and the operating elements of the second and third rows – trace by trace; in this case the operating elements of the first and third rows are installed (regarding the supporting wheels) to the same stillage depth, i. e. their tabs are mounted in the same horizontal plane; the operating elements of the second row are installed on the less tillage depth (i. e. above) rather than the operating elements of the first and third rows.

In the process of running the enhanced chisel — cultivator the operating elements of the first row interact with soil monolith, i. e. they run in the conditions of blocked-type cutting, and the operating elements of the second and the third rows in the process of work interact with soil layers, zones bordering the loosened operating elements of the first row; i. e. run in conditions of free (debloked-type) cutting.

The main task of operating elements of the first row is to form lateral loosened zones in order for operating elements of the second row to operate in condition of free-typed cutting. Therefore they are made in the form of dual-edged flat wedge, i. e. in a form of narrow loosening claw with a flat working surface. In this case, firstly the soil is deformed to the side of field surface, i. e. in the direction of open surface, secondly volume of being deformed soil is reduced in conditions of blocked-type cutting. As it is well known, [1] both of those two factors lead to reduce energy (power) expenditures for soil tillage.

Operating elements of the second and third rows of the developed chisel — cultivator is made in a form of a three-edged wedge, i. e. in a form of the arrow-type claw, and in this case efforts spent for soil deformation and destruction, they will direct to zones side loosened by the operating elements of the first row and the result is a reduction in energy costs [1; 2].

Arrangement the operating elements of the first and second rows at staggered sequence on the framework, and the second and third rows trace by trace, as well as the installation of the operating elements of the second and third rows stepwise (throughout soil tillage depth), i. e., the installation of the second row operating elements is higher than the third row relatively the operating elements of the third ensures layer by layer soil loosening; and consequently it leads to improvement of the its crushing quality.