

Aneta Skalec

Uniwersytet Humanistyczno-Przyrodniczy im. Jana Długosza w Częstochowie

ORCID: 0000-0001-9572-9029

## NORMS AND LEGAL PRACTICE IN ANCIENT EGYPT: A CASE STUDY OF IRRIGATION SYSTEM MANAGEMENT

The prosperity of Egyptian civilization has depended on the efficient use of water deriving from the Nile throughout its recorded history<sup>1</sup>. Despite the importance of water and irrigation in ancient Egypt, very little is known of its water regulations<sup>2</sup>. The only known legal source containing legal norms related directly to the maintenance of canals that has been preserved till our times is a section of the *Dikaiomata* (*P. Hal.* 1)<sup>3</sup> – the only extant collection of Alexandrian legal regulations and procedures from Ptolemaic times<sup>4</sup>, a fragment of which deals with the construction and improvement of irrigation canals in the surrounding countryside. However, it does not seem to correspond exactly to the legal practice that has been in use in Ptolemaic Egypt. How water regulations looked like in practice can therefore only be observed by means of practice documents, i.e. papyri from Lagid's ruling. These documents of legal practice and their similarities and differences to the legal norms included in the *Dikaiomata* will be the subject of this article.

The *Dikaiomata* provided legal maxims and instructions for the lawyers in form of juridical pronouncements and royal ordinances. It apparently constituted the legal text called upon to support one side, and it ranges over a number of subjects in the extracts, i.a. false witnesses, drunkenness and quarrels, protection of

---

<sup>1</sup> On this subject see: K. W. Butzer, *Early Hydraulic Civilization in Egypt: A Study in Cultural Ecology*, Chicago 1976; W. Schenkel, *Die Bewässerungsrevolution im Alten Ägypten*, Mainz 1978; E. Eidesfelder, *Zur Frage der Bewässerung in pharaonischen Ägypten*, „ZÄS” 1977, issue 106, pp. 37-51; J.G. Manning, *Irrigation et état en Égypte antique*, „Annales” 2002, issue 57.3, pp. 611-623.

<sup>2</sup> K. W. Butzer, *Early Hydraulic Civilization...*, p. 16.

<sup>3</sup> F. Blass, W. Dittenberg, *Dikaiomata: Auszüge aus alexandrinischen Gesetzen und Verordnungen in einem Papyrus des Philologischen Seminars der Universität Halle (Pap.Hal. 1) mit einem Anhang weiterer Papyri derselben Sammlung*, Berlin 1913. Cited as *P. Hal.* 1.

<sup>4</sup> F. Blass, W. Dittenberg, *P. Hal.* 1, pp. 37-38; R.S. Bagnall, P. Derow, *The Hellenistic Period: Historical Sources in Translation*, Oxford 2004, p. 206.

Alexandrians against slavery etc.<sup>5</sup>. It is dated to the 3<sup>rd</sup> century BC<sup>6</sup>. The passage that interests us is included in lines 106-114.

[Cutting and cleaning] of canals. If anyone wishes to cut a new canal or to dig up an old one - - - - - to the neighbors of the land and each shall contribute a share towards the e[xpenses, and he shall cast up] half of the excavated [earth] on each side. If anyone does not wish to contribute, the person cutting the canal or digging it up shall cast up [the earth] for his side onto the land of whichever one is willing, and if successful in a suit he shall exact twice [the expense].

If canal on someone's own land [is choked, they shall] contribute to him for the cleaning the canal - - - each according to his share, and anyone who does not contribute shall be [liable to the person doing the cleaning] for thrice the expense if he is defeated in a suit<sup>7</sup>.

The quoted fragment of the *Dikaiomata* focused on digging and cleaning of ἡ τάφος, and therefore a ditch or an irrigation canal<sup>8</sup>. The regulations contained therein, would not be applied within the limits of the city itself, but in the Alexandrian countryside – *chora*<sup>9</sup>, where an extensive irrigation system existed<sup>10</sup>, in connection to which certain obligations related to maintenance were imposed on the owners of neighboring land<sup>11</sup>.

In this passage, two separate regulations can be distinguished: the first (ll. 107-111) concerning τέμνω – exercise/making<sup>12</sup> and ἀνάγω – renewal<sup>13</sup> of canals constituting boundaries between the plots (as evidenced by the fact that the land from excavations was thrown equally into the plots of land on both sides of the canal<sup>14</sup>), and the second (ll. 111-114) referring to the cleaning of canals (ἀνακάθαρσις – clean)<sup>15</sup>.

<sup>5</sup> F. Blass, W. Dittenberg, *P. Hal.* 1, p. 26; R.S. Bagnall, P. Derow, *The Hellenistic Period...*, p. 206.

<sup>6</sup> F. Blass, W. Dittenberg, *P. Hal.* 1, pp. 37-38; R.S. Bagnall, P. Derow, *The Hellenistic Period...*, p. 206.

<sup>7</sup> Translation quoted after R.S. Bagnall, P. Derow, *The Hellenistic Period...*, pp. 207-208, with the changes by the author.

<sup>8</sup> P. Chantraine, *Dictionnaire étymologique de la langue grecque: Histoire des mots*, Paris 1968-1980, s.v θάπτω.

<sup>9</sup> About Alexandrian *chora* see A. Jähne, *Die Αλεξανδρέων χώρα*, „Klio” 1981, issue 63, pp. 63-103.

<sup>10</sup> F. Blass, W. Dittenberg, *P. Hal.* 1, pp. 73-74; J. Partsch, *Die alexandrinischen Dikaiomata*, „Afp” 1913, issue 6, pp. 52-53; A. Jähne, *Die Αλεξανδρέων χώρα...*, pp. 86, 94.

<sup>11</sup> F. Blass, W. Dittenberg, *P. Hal.* 1, p. 74; J. Partsch, *Die alexandrinischen...*, p. 52.

<sup>12</sup> *WB* II s.v.; *LSJ* s.v.

<sup>13</sup> *WB* I s.v.; *LSJ* s.v.

<sup>14</sup> J. Partsch, *Die alexandrinischen...*, p. 53; J. Vélissaropoulos-Karakostas, *Alexandrianoi nomoi: politikē autonomia kai nomikē autoteleia tēs ptolemaikēs Alexandreias*, Athena 1981, p. 92.

<sup>15</sup> *WB* I s.v. – „Reinigung”; *LSJ* s.v. – „clearing away, cleaning”.

In the first case, when someone wanted to make a new canal or renew an old one, he had to make an agreement with the neighbors, but the text does not contain a detailed information on how they should proceed. The publishers suggest that in the lacuna in l. 108 there was a verb used for the official notifications – ἀπαγγέλλω, ἐπαγγέλλω – „to say, inform, notify”<sup>16</sup>. It would mean „the need to inform” other neighbors about the work on the canals<sup>17</sup>. However, as Partsch rightly pointed out<sup>18</sup>, it seems doubtful that only one person could impose on their neighbors the obligation to perform the canal. He suggests, therefore, that the word συναλλαττέσθω could be found here, i.e. „ally, agree, enter into agreements”, indicating that the person with initiative had to agree to carry out such an undertaking with the neighbors<sup>19</sup>.

It can be assumed that creating a new canal required the agreement of the majority of farmers whose lands it was to cross and who would benefit from the work carried out and who was obliged to bear costs related to them<sup>20</sup>. *P. Hal.* 1 shows that each of the neighbors had to participate in expenses incurred to carry out the work. The type of costs and the way they were divided had to be determined in some way, but it was not described in the *Dikaionata*. The publishers suggested, as the most natural according to them, the distribution in which the share of each of the neighbors was determined proportionally to the length of the border of their plot along the canal<sup>21</sup>. The second probable way of sharing costs between neighbors was the distribution proportional to the area of land cultivated by individual farmers.

If someone refused to participate in works on the canals, and yet they were carried out, it was possible to apply certain legal measures against them<sup>22</sup>. First of all, it was possible to drop all the excavated soil onto a chosen side, either onto the bank of people carrying works or not participating in them, without having to split it in half. In addition, it was possible to bring a lawsuit against a person or persons not participating in the canal’s making and if it was won, the defendant was obliged to pay double the amount of the expenses<sup>23</sup>. In this way, the person who refused to cooperate in carrying out works on the irrigation system, but at the same time benefited from their performance, was forced to participate in the costs.

<sup>16</sup> *WB* I s.v. – „melden, Bericht erfassen”; *LSJ* s.v.

<sup>17</sup> F. Blass, W. Dittenberg, *P. Hal.* 1, p. 74.

<sup>18</sup> J. Partsch, *Die alexandrinischen...*, p. 53.

<sup>19</sup> *WB* II s.v. – „vereinbaren, Bereinbarung treffen”; *LSJ* s.v.

<sup>20</sup> J. Partsch, *Die alexandrinischen...*, p. 53.

<sup>21</sup> F. Blass, W. Dittenberg, *P. Hal.* 1, p. 74.

<sup>22</sup> B. Anagnostou-Canas, *Litiges en rapport avec l’eau dans l’Égypte ptolémaïque*, (in:) I. Andorlini, G. Bastianini, M. Manfredi, G. Menci (eds.), *Atti del XXII Congresso Internazionale di Papirologia*, Firenze, 23-29 agosto 1998 I, Firenze 2001, p. 48.

<sup>23</sup> F. Blass, W. Dittenberg, *P. Hal.* 1, p. 75.

The second part of the discussed fragment of the *Dikaiomata*, i.e. lines 111-115, concerned cleaning the canals, which included all kinds of activities such as removing mud, soil or plants harmful to the canals. Failing to participate in this type of work resulted in a need to pay triple costs per person if the lawsuit was lost. This increased responsibility in case of cleaning a channel can be explained, according to the editors, by the community's greater interest in maintaining existing canals than in the performance of new ones<sup>24</sup>.

Lines 106-114 of the *Dikaiomata* clearly pointed to the duties of neighbors concerning the performance and maintenance of the irrigation network and the need for their cooperation in this area. They were the beneficiaries of its existence, and therefore they had to bear the related burdens. Its maintenance and extension was therefore regulated by the legal provisions existing in the interest of the whole community, not only of individual farmers, and the control and supervision over the performance of duties by the neighbors was exercised by the court officials when any landowner failed to participate in the work<sup>25</sup>.

This fragment of the *Dikaiomata* is not known from any other source, but the publishers suggest that it most probably came, as well as the earlier lines regarding spacing from the neighboring area in case of works (ll. 79-105), from πολιτικὸς νόμος – Alexandria city law or some fragment of it, which could be entitled e.g. τοῦ π [ἐρὶ τάφρων νόμου] – „from the law on ditches or canals”<sup>26</sup>. The regulations included here have, according to the majority of authors, a Greek origin<sup>27</sup>. Perhaps they were modeled on the Athenian law, as the fragment of *Acta Alexandrinorum* indicated the identity of the laws of Alexandria and Athens<sup>28</sup>, but it is not sure. Wolff admits the possibility that the Athenian law applied in Alexandria but tends to see here a mix of Greek laws coming from different locations of the Greek world rather than specifically from Athens<sup>29</sup>. As to the other conclusions, scholars

<sup>24</sup> F. Blass, W. Dittenberg, *P. Hal.* 1, pp. 75-76; Partsch, *Die alexandrinischen...*, p. 53.

<sup>25</sup> A. Jähne, *Die Αλεξανδρέων χώρα...*, p. 94; J. Vélissaropoulos-Karakostas, *Alexandrinoi nomoi...*, p. 89.

<sup>26</sup> F. Blass, W. Dittenberg, *P. Hal.* 1, pp. 66, 73. However, Partsch pointed out that is not certain. According to him, these regulations may have been drawn not from *politikos nomos*, but from some law concerning arable land, because they referred to situations not occurring mainly in the city (J. Partsch, *Die alexandrinischen...*, p. 53). Vélissaropoulos-Karakostas completes this line precisely as τοῦ π [ολιτικοῦ νόμου] (J. Vélissaropoulos-Karakostas, *Alexandrinoi nomoi...*, pp. 85-93).

<sup>27</sup> J. Méléze Modrzejewski, *Loi et coutume dans l'Égypte grecque et romaine (JJurPap Supplement XXI)*, Warszawa 2014, pp. 185-186; J. Vélissaropoulos-Karakostas, *Alexandrinoi nomoi...*, p. 89.

<sup>28</sup> *P. Oxy.* XVIII 2177, 12-15 (3rd century AD, Oxyrhynchos); J. Méléze Modrzejewski, *Loi et coutume...*, p. 135.

<sup>29</sup> H. J. Wolff, *Das Recht der griechischen Papyri Ägyptens in der Zeit der Ptolemäer und des Prinzipats I. Bedingungen und Triebkräfte der Rechtsentwicklung*, München 2002, pp. 64-67.

inferred that the law contained in the *Dikaiomata* is not entirely that of Athens, as far as we know the law of this city through the present documentation. Thus it cannot be precluded that there might be some influences of laws pertaining to a city in Asia Minor or to a Greek island that are still unknown to us<sup>30</sup>.

In the sources of the Greek law preserved until our times we do not find regulations identical to those contained in the *Dikaiomata*, but certain parallels to them are shown in the fragment of Plato's *Laws* (Plat., *Laws* VIII 844 c-d). Although it concerned rainwater, appropriate for the Greek climate, it also provided the need for cooperation between neighbors in the use of water, and in case of disagreement, stipulated the intervention of the officials who indicated everyone what to do<sup>31</sup>.

In the interpretation of *Dikaiomata*, seeing in it the application of the Greek law, scholars were apparently leaving aside any impact whatsoever of the autochthonous institutions that latently descended from the Pharaonic civilization<sup>32</sup>. This, however, seems not to be the case in the fragment of the *Dikaiomata* related to the canals. The Greek, and not Egyptian, origins of the discussed fragment of the Alexandrian legislation are suggested by the terminology used in *P. Hal.* 1, describing elements of the irrigation system, which is much more in line with the language of classical Greek authors than those of the Greek papyri from Egypt<sup>33</sup>. Furthermore, although in theory law might be changed as an adaptation to the local conditions, regulations concerning the soil ejection deny this

<sup>30</sup> A. Schafik, *New Light on the katagraphe and its Pharaonic Background*, (in:) T. Gagos, A. Hyatt (eds.), *Proceedings of the Twenty-Fifth International Congress of Papyrology Ann Arbor, July 29-August 4, 2007*, Ann Arbor 2010, p. 13.

<sup>31</sup> J. Partsch, *Die alexandrinischen...*, pp. 52-53; E. Klingenberg, *Platons νόμοι γεωργικοί und das positive griechische Recht*, Berlin 1976, pp. 85-93; F. Blass, W. Dittenberg, *P. Hal.* 1, p. 74.

<sup>32</sup> A. Schafik, *New Light...*, p. 13.

<sup>33</sup> The term used in *P. Hal.* 1 for the canal was ἡ τάφος, the meaning of which has already been discussed (see above). It often occurred in the *Iliad* and other classic Greek authors, such as Polybius, usually in the general sense of the pit, ditch, moat or trench, appearing also in the military context. However, it is certified only in five papyrus documents, all dated to the 3rd and 2nd centuries BC: *P. Alex.* 4, 8 (3 century BC, Arsinoites); *P. Iand. Zen.* 68, 9 (mid-3rd century BC, Philadelphia); *PSI VI* 595.5 (mid-3rd century BC, Philadelphia); *BGU VI* 1216, 19 (110 BC, Memphis); *P. Köln IV* 186, 4-5 (2 century BC, ?).

In *Dikaiomata*, therefore, there is a very general term, commonly used in Greece for the designation of canals, but essentially unaccepted in Egypt. In Greek papyrus, differently, elaborated terminology was used to describe particular types of channels. It was first collected and developed by A. Calderini, see A. Calderini, *Ricerche sul regime delle acque nell'Egitto Greco-Romano. I - introduzione*, „Aegyptus” 1920, issue 1, pp. 37-62, and above all pp. 41-65). Later, this problem was addressed by J. Krüger, see J. Krüger, *Terminologies der künstlichen Wasserläufe in den Papyri des griechischen-römischen Ägypten*, „MBAH” 1991, issue 10.2, pp. 18-27. The most extensive work on this subject is the publication of D. Bonneau, see D. Bonneau, *Le régime administratif de l'eau du Nil dans l'Égypte Grecque, Romaine et Byzantine*, Leiden 1993, pp. 5-32.

possibility, as they do not fit the Egyptian reality. The construction of embankments was a vital question in Egypt, and for this purpose soil taken from canals was used. It was natural that the earth was divided in equal proportions between the two sides, as is stated also in the *Dikaiomata*. However, as a punishment for failing to cooperate in the canal's making, only throwing the earth on the side of neighbors participating in works would make sense, as more soil meant bigger protection and at the same time huge problem for a person not participating in the works, as their fields would be flooded with water from the Nile and all the cultivations would be lost. On the contrary, throwing the whole soil onto the side of a person not participating in the canal's making, in case of Egypt would not have any sense, as it would be a benefit for the not participating person. Taking all that into consideration it should be assumed that the regulations contained in *P. Hal.* 1 regarding the irrigation system management had other than Egyptian origins.

Were rules contained in the *Dikaiomata* really applied in practice in the countryside of Alexandria? Because of the very low number of papyri deriving from Alexandria and its surroundings<sup>34</sup>, we do not have any document clearly certifying their application. However, Jähne indicated that in the papyrus *BGU* IV 1121=*Sel. Pap.* I 41 (5 BC, Alexandria), a land lease contract for papyrus marsh, the tenants were supposed to clean out the canals (ll. 24-26):

(...) and the river and the cross canals on their land they shall fill in and excavate and reshape and render navigable, just as they received them, at their own expense<sup>35</sup>.

The author adds that the earth should be thrown on both banks of the canals<sup>36</sup>, but nothing in the text clearly indicates it, as it only refers to their proper maintenance without specifying any details. It is, therefore, difficult to say whether the performance of these duties was based on the observance of the law given in the *Dikaiomata*.

We do not find any clear confirmation of application of the *Dikaiomata* rules in practice in the documents deriving from Alexandria and its surroundings. Can we therefore find some confirmation of their application in the papyri from the other parts of Egypt? Such attempt might seem controversial. However, we need

---

Already in the 3<sup>rd</sup> century BC the term most often used for a channel in Egypt was διώρυξ. It was applied to the canals of Egypt in Greek in all epochs, even before the conquest of the country by Alexander the Great (see, for example, *Hdt* II 124, II 127). D. Bonneau, *Le régime administratif...*, pp. 13-18.

<sup>34</sup> J. Méléze Modrzejewski, *Loi et coutume...*, p. 102.

<sup>35</sup> Translation quoted after A.S. Hunt, C.C. Edgar, *Select Papyri I. Private Affairs*, London, Cambridge 1932, p. 127.

<sup>36</sup> A. Jähne, *Die Αλεξανδρέων χώρα...*, p. 93.

to remember that everywhere in Egypt analogical irrigation system existed, and Alexandria was not an exception<sup>37</sup>.

Ancient Alexandria was located on the northwestern edge of the Nile Delta. The main canal in this part of the Delta was the Canopic Branch of the Nile, which at the head of the Delta splits into two routes, the main one continuing to Canopus where it discharged, while the secondary route forming what was known as the Schedia Canal, also known as the Alexandria Canal, which flowed towards Alexandria in the north-west. As it approached Alexandria, the Schedia Canal bifurcated into two branches at the Alexandrian suburb of Eleusis. The first branch turned towards the north-east leading to Canopus, east of Alexandria, while the other branch continued south of Alexandria and along the lake Mareotis' northern shore, until it flowed out into the western harbour. Those canals were subsequently divided into smaller and smaller canals irrigating the flood pools limited by the embankments<sup>38</sup>.

The area around Alexandria was obviously not unique in terms of existence of an extensive irrigation system<sup>39</sup>. The riches of Egypt, its land and its crops depended everywhere on the irrigation, therefore the issue of making and maintaining canals was very important everywhere<sup>40</sup>. This is why it is worth investigating whether confirmations for neighbors' involvement in the maintenance of canals and embankments originate from other parts of the country, as there are no reasons to believe that irrigation system near Alexandria differed in any significant way from other parts of Egypt, also in terms of the system management.

How this system worked during the Ptolemaic period can be seen in Faiyum Oasis. The oasis became the scene of a great project for land reclamation and colonization under Ptolemy II Philadelphus (284–246 BC) and his son and successor Ptolemy III Euergetes (246–221 BC). The task involved the drainage of the marshland, the clearing out of bushes, reeds, and other swamp vegetation, and construction of main and subsidiary irrigation canals to carry the water of the Bahr Yusef to supply the needs of cultivation. The whole scheme of irrigation was directed by the Greek engineers of the government, but was native in its nature<sup>41</sup>.

The principal elements of the Ptolemaic irrigation system included the embankment at the entrance to the depression, the construction of main and sub-

<sup>37</sup> *Ibidem*, p. 94.

<sup>38</sup> E. Khalil, *The Sea, the River and the Lake: All the Waterways Lead to Alexandria*, „Bollettino di Archeologia on Line” 2010, issue 1, pp. 33-34, 38, [http://www.bollettinodiarcheologiaonline.beniculturali.it/documenti/generale/5\\_Khalil\\_paper.pdf](http://www.bollettinodiarcheologiaonline.beniculturali.it/documenti/generale/5_Khalil_paper.pdf) (visited October 26, 2018).

<sup>39</sup> A. Jähne, *Die Αλεξανδρῶνον χώρα...*, p. 94.

<sup>40</sup> A.E.R. Boak, *Notes on canal and dike work in Roman Egypt*, „Aegyptus” 1926, issue 7, p. 218.

<sup>41</sup> A.E.R. Boak, *Irrigation and population in the Faiyûm, the garden of Egypt*, „Geographical Review” 1926, issue 16.3, p. 370.

sidiary irrigation supply canals, the basins limited by the embankments, and the drainage of excess water into Lake Qarun, in the northern part of the depression<sup>42</sup>. The same elements, e.g. the canals and embankments, were also the elements of the irrigation system elsewhere in Egypt<sup>43</sup>.

Despite the basic importance of the irrigation system for the life of Egypt and its economy, also in Faiyum Oasis, we have only one text indicating indirectly the involvement of the neighbors in the maintenance of irrigation system there. It is *SB XVIII 13735*<sup>44</sup> – a petition from the Arsinoite nome dated to the second century BC:

To Teos, a *komogrammateus* of the village of Attinou Isieion from Protomachos, son of Protomachos, one of the catoecic cavalrymen. It has been a habit for a long time that (those) who have *kleros* and other lands near the canal leading from Attinou Isieion, which is a reservoir, dig the earth from the channel onto the embankments, so that the land is not flooded. Therefore, I submit (petition), so that you command the farmers and landowners, to dig up the canals and strengthen the canal embankments before the inflow of water, or to help us when my land is flooded. In case the farmer and me would be responsible for flood of (plots), (please) that a copy of the petition be included in the register. It happened that I submitted petitions regarding these things to the *strategos* and *basilikos grammateus*. Farewell<sup>45</sup>.

In this petition, Protomachos asked the village writer (*komogrammateus*) to call on local farmers to carry out their duties related to the works on the irrigation system. If they did not come, he was asking for help in the event of flooding the area. He did not specify exactly what support he would expect, but perhaps he meant the co-financing by the neighbors of the burden that had to be paid from land, i.e., for example, a rent or taxes due to the state, as well as the renewal of the embankments.

*SB XVIII 13735* is not fully clear due to the lack of analogy, rare vocabulary, and quite an unusual form compared to the other petitions known to us. However, there is an explicit information in it about the need to carry out works on the canals by people whose plots lay along them<sup>46</sup>, and therefore closer or further neighbors. These works included two types of activities – firstly excavating the earth, and thus making and cleaning of canals, and secondly strengthening of the canal's embankments.

<sup>42</sup> Y. Rapoport, I. Shahar, *Irrigation in the Medieval Islamic Fayyum: Local Control in a Large-Scale Hydraulic System*, „JESHO” 2012, issue 55.1, p. 2.

<sup>43</sup> J. Barois, *Irrigation in Egypt*, Washington 1889, p. 22.

<sup>44</sup> L. Criscuolo, *Petizione di un cleruco al comogrammateo*, (in:) S. F. Bondi (ed.), *Studi in onore di Edda Bresciani*, Pisa 1985, pp. 127-133.

<sup>45</sup> Translation by the author.

<sup>46</sup> The term used to describe them was the verb ὑπόκειμαι (II 5-6: τοὺς ὑποκειμένους κλήρους καὶ τὰς ἄλλας γῆς), which means lying nearby (*LSJ* s.v.), in this case near the canal.



This is in line with the general picture of the duties falling within the scope of the work on the canals in the Ptolemaic Egypt, which included: cutting down the bushes and other vegetation growing on the embankments, removing the accumulation of mud, grass and reeds from the bed of the channel, strengthening the embankment by filling up the cuts so that the dykes will retain their original thickness and strength<sup>47</sup>. In the event of failure to do so, any weakness could cause the water to overflow or break in at one of the weak points of the embankments and flooding the fields below the canal level<sup>48</sup>, which Protomachos points in his petition.

According to Hengstel, the actions indicated in this document corresponded to the obligations resulting from *P. Hal.* 1. He emphasized, however, that this convergence was rather the result of natural participation in the creation and maintenance of an extensive irrigation system by people using it, rather than the direct application of the rules provided in the *Dikaiomata*<sup>49</sup>.

I agree with this interpretation. It is supported by the fact that the procedure applicable in a situation where farmers did not perform their duties was different in both documents. According to the provisions of the *Dikaiomata*, in such a case it was possible to proceed with works without the participation of all neighbors, and the one who wrongly refused to do so was sued for a refund of the costs. It appears from *SB XVIII 13735* that in a situation when problems arose in the execution of works it was necessary to ask the appropriate officials to call on farmers to fulfill their obligations. This corresponded much more to the Egyptian reality, in which, due to the irrigation of fields with use of pools constituting a system of connected vessels, the inhabitants of Egypt could not independently decide on the execution of works on canals and dams, and they were managed and controlled by the state<sup>50</sup>.

So, according to the lines 106-114 of the *Dikaiomata*, the decision to carry out the irrigation works belonged to the neighbors themselves, took place without the participation of the authorities, and the refusing person was not forced to carry them out, but only later in the court the part attributable to him was claimed,

<sup>47</sup> A.J.R. Boak, *Notes on canal...*, p. 218; D. Bonneau, *La crue du Nil, divinité égyptienne, à travers mille ans d'histoire (332 av.-641 ap. J.-C.), d'après les auteurs grecs et latins et les documents des époques ptolémaïque, romaine et byzantine*, Paris 1964, pp. 53-55.

<sup>48</sup> A.E.R. Boak, *Notes on canal...*, p. 218.

<sup>49</sup> J. Hengstl, 'Wasser' in *den Urkunden des griechisch-römischen Ägypten*, (in:) B. Menu (ed.), *Les problèmes institutionnels de l'eau en Égypte ancienne et dans l'Antiquité méditerranéenne*, Cairo 1994, p. 226.

<sup>50</sup> D. Bonneau, *Usage et usages de l'eau dans l'Égypte ptolémaïque et romaine*, (in:) B. Menu (ed.), *Les problèmes institutionnels de l'eau en Égypte ancienne et dans l'Antiquité méditerranéenne*, Cairo 1994, p. 49; P.J. Sijpesteijn, *Penthemeros-Certificates in Graeco-Roman Egypt*, Leiden 1964, pp. 18-19.

while the intervention of the officials provided in a situation when the owners of areas located along the canals did not perform their duties is visible in *SB XVIII 13735*. This was to force them to do so.

In addition, the duties set out in *SB XVII 13735*, which concentrated, just like in the *Dikaionmata*, on the works on irrigation systems, were based on the old custom evoked by Petesuchos (l. 4-5: ὄντος ἐθισμοῦ ἔτι ἄνωθεν). Therefore, it seems that the regulations from line 106-114 of *P. Hal. 1*, might be applied in the Alexandria area, but even that is doubtful, due to the existence of an old and established Egyptian custom in connection with irrigation system, shaped throughout history and growing out of local needs, so there was basically no need to replace it with new regulations. After the conquest of Egypt by Alexander the Great, the organization of irrigation was still native and remained so at the basic level of works on the canals and dams, and the Greeks basically did not show any interest in making changes in this area<sup>51</sup>.

Generally, therefore, in Pharaonic Egypt, as well as later in Ptolemaic and Roman times, the preservation of main canals was a shared responsibility of all farmers, because it was in the interest of the entire community to maintain the irrigation system in the right condition. It was implemented through annual forced labor on the embankments and dams<sup>52</sup>, which lasted from April to May, when the Nile was at the lowest level. At this stage, the whole country was united in efforts to prepare for the flooding – farmers were working on the irrigation system, and the authorities watched over their proper organization<sup>53</sup>. On the contrary, in Greece irrigation was practiced on very small scale because of natural conditions. Probably because of that Greeks, who conquered Egypt, left irrigation management to the indigenous population and their practical competence<sup>54</sup>.

There are few documents from the period of the Lagid's rule that allow the reproduction of activities related to the irrigation system management. It appears that public geometers determined the necessary number of ναύβια<sup>55</sup>, which had to be dug from the canals and divided it between several villages according to their size. Then κωμογραμματεὺς organized the distribution of work between

<sup>51</sup> D. Bonneau, *L'Égypte dans l'histoire de l'irrigation antique: de l'époque hellénistique à l'époque arabe*, (in:) L. Criscuolo, G. Geraci (eds.), *Egitto e storia antica dall'ellenismo all'età araba: Bilancio di un colloquio internazionale*. Bologna, 31.8-2.9.1987, Bologna 1989, pp. 302-303.

<sup>52</sup> R.J. Forbes, *Studies in Ancient Technology II. Irrigation and Drainage, Power [Water- and Windmills], Land Transport and Road Building. The Coming of Camel*, Leiden 1993, p. 27.

<sup>53</sup> D. Bonneau, *Le cycle du Nil: aspects administratifs à l'époque gréco-romaine*, „BSFE” 1991, issue 120, pp. 18-19.

<sup>54</sup> D. Bonneau, *L'Égypte dans l'histoire...*, pp. 303-304.

<sup>55</sup> *Naubion* – it is the cubic unit regularly employed in receipts for measuring the amount of Nile sediment taken out of the canals. D. Bonneau, *Le régime administratif...*, pp. 131-132; P.J. Sijpesteijn, *Penthemeros-Certificates...*, pp. 18-22.

individuals<sup>56</sup>. Each of the inhabitants of Egypt had to dig a certain number of *ναῦβια* from the sewers, which was related to the surface of the area he cultivated – the more land someone had, the more they had to dig it out. It is logical to assume that those works were performed by the workers on the canals bordering their land or those running through it<sup>57</sup>.

We were there in a front of forced labour (*corvée*) upon the dykes and canals, common in Egypt through its history. The life of the country did indeed depend upon the proper distribution and control of the Nile-water, and the Ptolemaic government had no scruple in calling up the native population to do any work necessary in order to make the country give its full agricultural return<sup>58</sup>.

Local farmers were then involved in the work on the embankments and dams, but they did not decide on their own on regards, and their activities were coordinated and managed by officials. While cooperation between neighbors was undoubtedly desirable in this respect, it remained always in the shadow of administrative regulations and probably that is why we find only scarce traces of it in papyrus documentation. It was the officials who decided who, where and how much work was supposed to do, so there was no one left with the freedom to carry out works on his own. Also in a situation where someone did not perform his duties related to maintaining the irrigation system, he was not forced by his neighbors to do so, but the authorities were expected to intervene.

The system of works on canals and dams used in practice in Egypt was therefore much more in line with the picture resulting from the Petesuchos petition (*SB XVIII 13735*), than the *Dikaiomata*. This suggests that the regulations contained in lines 106-114 of *P. Hal.* 1, concerning the exercise and renewal of canals, were, if at all, applied only in the area of the Alexandrian *chora*, but it seems rather unlikely, as also the canals were there a part of bigger system, based on the local and old Egyptian custom. This native Egyptian custom did not leave farmers – hoes land was located within the floodplain basins – the freedom which we see in the *Dikaiomata* passage regarding the exercise and maintenance of canals. This greater independence provided by Greek law probably resulted from the failure of such an extensive irrigation system in Greece, whereby farmers usually formed small agricultural communities that themselves regulated their water use relations<sup>59</sup>.

Irrigation of fields using floodplains was very effective, but required absolute discipline on the part of the state and farmers to ensure the proper functioning of

<sup>56</sup> *Ibidem*, pp. 18-19.

<sup>57</sup> D.W. Rathbone, *Economic Rationalism and Rural Society in Third-Century AD Egypt: The Heroninos Archive and the Appianus Estate*, Cambridge 1991, p. 220; W. Willcocks, J.I. Craig, *Egyptian Irrigation I*, London 1913, p. 401.

<sup>58</sup> R.J. Forbes, *Studies in Ancient Technology...*, p. 27.

<sup>59</sup> E. Klingenberg, *Platons...*, s. 81.

the system, including monitoring of the condition of shafts and canals, carrying out works and immediate repairs in the event of sudden interruption or blockage. Therefore, to ensure its proper operation and proper maintenance, cooperation and coordination was needed at a higher level than neighborly relations. It was not possible to keep the fields only by small communities of people living in the surrounding areas. Therefore, the cooperation between neighbors was not a priority element in Egypt, reflected in the sources preserved to our times, although it was probably desirable. For this reason, there is no place here for the solutions of Greek origin, which does not correspond to Egyptian reality and specifics, as the maintenance of the irrigation system was based on the old local custom.

Obviously we see certain similarities between the *Dikaiomata* and the rules typical for Egyptian customs regarding the irrigation system management. Those similarities, however, do not seem to be a result of any direct influence or the transfer of rules from one law to another. They are the result of an analogous response to the given circumstances, and therefore for similar needs. Everywhere in the world, an irrigation system consists primarily of canals made by digging up soil, which is also used to create embankments. The differences lie however in who was responsible for organizing and carrying out works on irrigation system and in this regard, there is a clear difference between the *Dikaiomata* and Egyptian practice.

In the *Dikaiomata* we can see how the legal norms, also in antiquity, could differ from the practice and how they might have determined our understanding of the past. If the *Dikaiomata* would be preserved until our times without documents of practice, then we would think that the reality looked like the one presented in *P. Hal.* 1, which is not true, as we know thanks to the documents of practice. It shows how the norms can visibly differ from legal practice and how important is their comparison, not only in respect to the contemporary law, but also to the ancient laws, which might be more complicated, because of the lack of legal practice sources. Fortunately, in the case of Egypt, we have papyri that give us such an opportunity.

## BIBLIOGRAPHY

- Anagnostou-Canas B., *Litiges en rapport avec l'eau dans l'Égypte ptolémaïque*, (in:) I. Andorlini, G. Bastianini, M. Manfredi, G. Menci (eds.), *Atti del XXII Congresso Internazionale di Papirologia, Firenze, 23-29 agosto 1998 I*, Firenze 2001, pp. 41-49
- Bagnall R.S., Derow P., *The Hellenistic Period: Historical Sources in Translation*, Oxford 2004
- Barois J., *Irrigation in Egypt*, Washington 1889

- Blass F., Dittenberg W., *Dikaiomata: Auszüge aus alexandrinischen Gesetzen und Verordnungen in einem Papyrus des Philologischen Seminars der Universität Halle (Pap.Hal. 1) mit einem Anhang weiterer Papyri derselben Sammlung*, Berlin 1913
- Boak A.E.R., *Irrigation and population in the Faiyûm, the garden of Egypt*, „Geographical Review” 1926, issue 16.3, pp. 353-364
- Boak A.E.R., *Notes on canal and dike work in Roman Egypt*, „Aegyptus” 1926, issue 7, pp. 215-219
- Bonneau D., *La crue du Nil, divinité égyptienne, à travers mille ans d'histoire (332 av.-641 ap. J.-C.), d'après les auteurs grecs et latins et les documents des époques ptolémaïque, romaine et byzantine*, Paris 1964
- Bonneau D., *Le cycle du Nil: aspects administratifs à l'époque gréco-romaine*, „BSFE” 1991, issue 120, pp. 7-24
- Bonneau D., *L'Égypte dans l'histoire de l'irrigation antique: de l'époque hellénistique à l'époque arabe*, (in:) L. Criscuolo, G. Geraci (eds.), *Egitto e storia antica dall'ellenismo all'età araba: Bilancio di un colloquio internazionale*. Bologna, 31.8-2.9.1987, Bologna 1989, pp. 301-313
- Bonneau D., *Le régime administratif de l'eau du Nil dans l'Égypte Grécque, Romaine et Byzantine*, Leiden 1993
- Bonneau D., *Usage et usages de l'eau dans l'Égypte ptolémaïque et romaine*, (in:) B. Menu (ed.), *Les problèmes institutionnels de l'eau en Égypte ancienne et dans l'Antiquité méditerranéenne*, Cairo 1994
- Butzer K.W., *Early Hydraulic Civilization in Egypt: A Study in Cultural Ecology*, Chicago 1976
- Calderini A. *Ricerche sul regime delle acque nell'Egitto Greco-Romano. I – introduzione*, „Aegyptus” 1920, issue 1, pp. 37-62
- Chantraine P., *Dictionnaire étymologique de la langue grecque: Histoire des mots*, Paris 1968-1980
- Criscuolo L., *Petizione di un cleruco al comogrammateo*, (in:) S. F. Bondi (ed.), *Studi in onore di Edda Bresciani*, Pisa 1985, pp. 127-133
- Eidesfelder E., *Zur Frage der Bewässerung in pharaonischen Ägypten*, „ZÄS” 1977, issue 106, pp. 37-51
- Forbes R. J., *Studies in Ancient Technology II. Irrigation and Drainage, Power [Water-and Windmills], Land Transport and Road Building. The Coming of Camel*, Leiden 1993
- Hengstl J., *‘Wasser’ in den Urkunden des griechisch-römischen Ägypten*, (in:) B. Menu (ed.), *Les problèmes institutionnels de l'eau en Égypte ancienne et dans l'Antiquité méditerranéenne*, Cairo 1994, pp. 213-228
- Hunt A.S., Edgar C.C., *Select Papyri I. Private Affairs*, London, Cambridge 1932
- Jähne A., *Die Ἀλεξανδρέων χώρα*, „Klio” 1981, issue 63, pp. 63-103
- Khalil E., *The Sea, the River and the Lake: All the Waterways Lead to Alexandria*, „Bollettino di Archeologia on Line” 2010, issue 1, pp. 38, [http://www.bollettinodiarcheologiaonline.beniculturali.it/documenti/generale/5\\_Khalil\\_paper.pdf](http://www.bollettinodiarcheologiaonline.beniculturali.it/documenti/generale/5_Khalil_paper.pdf) (visited October 26, 2018)
- Klingenberg E., *Platons νόμοι γεωργικοί und das positive griechische Recht*, Berlin 1976
- Krüger J., *Terminologies der künstlichen Wasserläufe in den Papyri des griechischen-römischen Ägypten*, „MBAH” 1991, issue 10.2, pp. 18-27

- Manning J. G., *Irrigation et état en Égypte antique*, „Annales” 2002, issue 57.3, pp. 611-623
- Mélèze Modrzejewski J., *Loi et coutume dans l'Égypte grecque et romaine (JurPap Supplement XXI)*, Warszawa 2014
- Partsch J., *Die alexandrinischen Dikaiomata*, „AfP” 1913, issue 6, pp. 34-76
- Rapoport Y., Shahar I., *Irrigation in the Medieval Islamic Fayyum: Local Control in a Large-Scale Hydraulic System*, „JESHO” 2012, issue 55.1, pp. 1-31
- Rathbone D. W., *Economic Rationalism and Rural Society in Third-Century AD Egypt: The Heroninos Archive and the Appianus Estate*, Cambridge 1991
- Schafik A., *New Light on the katagraphe and its Pharaonic Background*, (in:) T. Gagos, A. Hyatt (eds.), *Proceedings of the Twenty-Fifth International Congress of Papyrology Ann Arbor, July 29-August 4, 2007*, Ann Arbor 2010, p. 13
- Schenkel W., *Die Bewässerungsrevolution im Alten Ägypten*, Mainz 1978
- Sijpesteijn P. J., *Penthemeros-Certificates in Graeco-Roman Egypt*, Leiden 1964
- Vélissaropoulos-Karakostas J., *Alexandrinoi nomoi: politikē autonomia kai nomikē auto-teleia tēs ptolemaikēs Alexandreias*, Athena 1981
- Willcocks W., Craig J.I., *Egyptian Irrigation I*, London 1913
- Wolff H.J., *Das Recht der griechischen Papyri Ägyptens in der Zeit der Ptolemäer und des Prinzipats I. Bedingungen und Triebkräfte der Rechtsentwicklung*, München 2002

### Summary

The prosperity of Egyptian civilization has depended on the efficient use of water deriving from the Nile throughout its recorded history. Despite the importance of water and irrigation in ancient Egypt, very little is known of its water regulations. The only known legal source related directly to the maintenance of canals that has been preserved is a section of the *Dikaiomata* – the Alexandrian city law dealing with the construction and improvement of irrigation channels in the surrounding countryside. However, being Greek in origin, it does not seem to correspond to the legal practice that has been in use in Egypt since the earliest times. How water regulations looked like in practice can therefore only be observed by means of practice documents, i.e. papyri from Ptolemaic period. Such papyri recorded the law in action, both in relation to individuals as well as the whole society in the context of water management. These documents and their similarities and differences to the rules contained in *Dikaiomata* are the subject of the paper.

### KEYWORDS

irrigation system, *Dikaiomata*, papyri

### SŁOWA KLUCZOWE

system irygacyjny, *Dikaiomata*, papirusy