Shifts in International Boundary Rivers

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I. Rivers as Boundaries

Rivers have been used as boundaries since time immemorial. They have always divided private lands, provinces and kingdoms and they continue to fulfil this function today. This is because rivers have many features which are attractive to those who wish to use them as boundaries between their territories. First of all, a river boundary is clearly visible and discernible, since it is a natural boundary. Secondly, it is easier to control than a land boundary, especially in the case of large rivers. Thirdly, making the river a boundary allows both riparian states to use it for purposes of navigation without the need of entering into additional agreements.

However, it would be false to say that a river boundary has only advantages. The main disadvantage is that a river tends to change its course. Either gradually, through erosion and gradual accretion, or violently, by breaking through one of its banks and creating a new arm at some distance from its previous bed. These two phenomena have caused problems ever since people started using rivers as boundaries. No wonder, therefore, that we find Roman lawyers already addressing this problem and providing solutions which – as will be shown – are workable and practicable not only in the field of private law but also in relations between sovereign states.

The aim of this article is to present the rules of public international law relating to shifts in international boundary rivers, showing their historical origin and the legal basis of their binding character in the international legal order.

II. Analogies From Private Law in Public International Law

One may ask: why should we resort to private law to determine the rules of public international law regarding shifts of boundary rivers? Is reasoning per analogiam from municipal private law admissible?

1. Article 38 of the ICJ Statute

The adoption of the Statute of the Permanent Court of International Justice (PCIJ) resolved to a large extent the uncertainty surrounding permissibility of recourse to private law in international jurisprudence. The Statute, in Article 38(3), enumerated
the sources of law applicable to disputes brought before the World Court. The Statute of the International Court of Justice (ICJ) reiterated the same catalogue of sources in Article 38(1). Consequently, since 1920, the World Court can adjudicate on the basis of: international conventions, international custom and the general principles of law recognised by civilised nations. In *subsidio*, it can have recourse to judicial decisions and the teachings of the most highly qualified publicists of various nations. Article 38 of the Statute is regarded as an authoritative statement on the sources of international law in general, not only sources of adjudication.\(^1\)

Since the adoption of the Statute, with its closed catalogue of sources of international law, direct recourse to Roman private law could no longer be advocated. However, solutions based on Roman law can still be assimilated into international law in a number of different ways. The most important avenue through which Roman law infiltrates into modern international law is the notion of “general principles of law recognised by civilised nations.” In fact, the same formulation was frequently included in the *compromis* of arbitral tribunals in the 19\(^{th}\) century.\(^2\) On this basis, arbiters had recourse to principles of private law when confronted with legal lacunae. However, arbitral tribunals were entitled to do so only if the parties to the dispute expressly provided for such a source of adjudication in their *compromis*. It could, therefore, be said that the drafters of the Statute of the PCIJ took account of this practice and sanctioned the use of private law principles in international jurisprudence by means of the general principles of law formula.\(^3\)

Beginning with the formative period, the writings of many highly regarded writers contain frequent analogies to private and Roman law. The same could be said of decisions of international arbitration tribunals.\(^4\) This chapter will address the issue of recourse to Roman law rules by analogy in the absence of express treaty provisions and customary law, i.e. through the avenue of general principles of law.\(^5\)

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4. For examples of international arbitration in which recourse to private law was of significant importance see: H. Lauterpacht, *op. cit.*, pp. 215–296.

5. The authors, therefore, do not address the question of international treaties which deal with shifts of international boundary rivers. Neither do they occupy themselves with the question whether the said rules may be regarded as international customary law. The two problems are interconnected and require a comprehensive study.
2. “General Principles of Law” and Reasoning per analogiam

The concept of general principles of law allows for citation of private law only by means of analogy. Therefore Roman law principles cannot be directly applied by the Court, but only per analogiam, provided that they are incorporated into municipal law. The positivist school opposed such an interpretation of the concept of general principles of law and advocated its limitation to “general principles of international law” or to “principles inherent in every legal system.” Major controversies arose as to the meaning and scope of the term “general principles of law” and their status in the hierarchy of sources of international law. Much has been written on the topic and it could be stated that most of the authors agree that the term relates to generally recognised principles of municipal law accepted by the principal legal systems of the world. However, the divergence of approach to private law analogies is still characteristic of the modern science of international law. While the rigid positivist approach is no longer predominant, most authors advocate caution and limited use of analogy in international law. The prevailing view is that analogy is permissible so long as it is applied mutatis mutandis only when adequate to relations between sovereign States.

As Anzilotti framed it, general principles of law represent a kind of “nuovissimo ius gentium nel senso classico” and “al nuovissimo ius gentium corrisponde un nuovissimo praetor, con poteri peraltro assai più limitati di quelli del pretore romano.” Lauterpacht expressed a similar view: “[General principles of law] are the modern jus gentium in its wider sense. In the sense here suggested, they are no more than a modern formulation of the law of nature which played a decisive part in the formative period of international law.” Not only does the concept of general principles resemble ius gentium as applied by Roman praetors, but their substantive content can also be rooted in the Roman law tradition. One could without doubt agree with Rousseau who regards the passage of Roman law into many national legal systems as an example of common principles which can be applied in relations between States.

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9 For a comprehensive discussion of different doctrinal opinions see B. Cheng, op. cit., pp. 2–5.


12 C. Rousseau: Principes généraux du droit international public (1944), p. 890: “Il s’agit de principes que la conviction juridique des États civilisés considérée comme devant nécessairement faire partie de tout ordre juridique et qui rappellent dans une certaine mesure le jus gentium des Romains, au sens originel du mot (droit concordant appliqué chez des peuples de même civilisation).”
The status of “general principles” in the hierarchy of sources is generally said to be subsidiary in relation to treaties and custom.\textsuperscript{13} Therefore, they could be cited only in the case of the absence or uncertainty of treaty provisions or custom.\textsuperscript{14} When there is a gap in a treaty or customary law, general principles serve as a residual source.

As can be inferred from the above submissions, a rigid positivist approach denying any possibility of recourse to municipal law can no longer be convincingly advocated.\textsuperscript{15} According to Bassiouni “There is a well established consensus that ‘general principles’ are to be derived from national legal systems.”\textsuperscript{16} It is also generally agreed that the purpose of the general principles of law concept is to “close the gap that might be uncovered in international law and solve this problem which is known legally as \textit{non liquet}.”\textsuperscript{17} The role of analogy with private law is particularly important if we take into account that “in the field of international law, where specific rules are relatively few, there is even more occasion for resorting to general principles than in municipal law.”\textsuperscript{18}

However, most authors agree that rules of private law cannot be transposed mechanically to the sphere of international law. As Brownlie puts it: “An international tribunal chooses, edits and adapts elements from better developed systems: the result is a new element of international law the content of which is influenced historically and logically by domestic law.”\textsuperscript{19} This approach is also evident from this passage in Judge McNair dissenting opinion in the case of \textit{International Status of South-West Africa}: “The way in which international law borrows from this source [i.e. private law] is not by means of importing private law institutions ‘lock, stock and barrel’, ready-made and fully equipped with a set of rules. The duty of international tribunals in this matter is to regard any features of terminology which are reminiscent of the rules and institutions of private law as an indication of policy and principles rather than as directly importing these rules and principles.”\textsuperscript{20} According to Cheng “international courts and tribunals apply to international relations those principles underlying municipal rules of law which have been found to work substantial justice between individuals, whenever circumstances similar to those justifying their application in the municipal sphere exist.”\textsuperscript{21}

The World Court used the concept of general principles sparingly and with much caution. Such an attitude should not be surprising given the long standing predominance of the positivist school in the science of international law and the subsidiary

\textsuperscript{13} W. Czapliński, A. Wyrożomska, \textit{op. cit.}, p. 17.
\textsuperscript{14} H. Lauterpacht, \textit{op. cit.}, p. 69; M. Shaw, \textit{op. cit.}, p. 96.
\textsuperscript{15} H. Lauterpacht writes about “a definite rejection of the dogmatic positivist view” (H. Lauterpacht, \textit{op. cit.}, p. 68).
\textsuperscript{17} M. Shaw, \textit{op. cit.}, p. 93.
\textsuperscript{18} B. Cheng, \textit{op. cit.}, p. xiii.
\textsuperscript{19} I. Brownlie, \textit{op. cit.}, p. 16.
\textsuperscript{20} 1950 \textit{ICJ} 128, p. 148.
\textsuperscript{21} B. Cheng, \textit{op. cit.}, 391.
character of the principles. However, the ICJ has referred on occasions to general principles of law,22 understood as rules generally accepted by municipal legal systems.23

As already stated above, for a rule to constitute a general principle of law it must be recognised in all of the world’s major legal systems. Consequently, Roman law rules on shifts of a boundary river cannot be directly applicable \textit{per se} but rather on the basis that they have made their way into the major systems of private law in the world. Then it must be proven that these rules are capable of being applied \textit{per analogiam} to international relations between sovereign states.

3. Analogy Between Private Law and International Law

Since the times of Grotius public international law has been treated as a “higher private law.”24 While public law \textit{ad statum rei publicae spectat} and regulates relations based on a state of subordination, private law \textit{ad singulorum utilitatem spectat} and regulates relations between subjects which are formally equal.25 Consequently, as Lauterpacht puts it, “formally, international public law belongs to the genus of private law,”26 as it is “from the point of view of the international community, distinctly individualistic.”27

This fundamental analogy between the legal orders could be referred to as a general analogy, opening up a series of more and more specific analogies. Various important differences between \textit{dominium} and \textit{imperium} notwithstanding, “the two notions [as Lauterpacht puts it] are essentially analogous on account of the exclusiveness of enjoyment and disposition which is in law the main formal characteristic of both private property and territorial sovereignty. They belong, in juridical logic, to the same class of rights.”28 A further insight reveals that there is still a more specific analogy, inferior to that between \textit{dominium} and \textit{imperium}. Lauterpacht underlines that recourse to analogy from private law is particularly evident in the modes of acquiring territorial sovereignty, owing to the “intrinsic similarity of relation”29 between private \textit{dominium} and statal \textit{imperium}.

Descending even further, one discovers that there is also an even more specific analogy – that between \textit{modi originarii adquirendi dominii} and \textit{modi originarii

\begin{itemize}
  \item M. Sh a w, \textit{op. cit.}, p. 99
  \item \textit{Ibid.}, p. 81 and the various authors cited therein.
  \item Cf. W. C z a p l i ń s k i, A. W y r o z u m s k a, \textit{op. cit.}, p. 3.
  \item H. L a u t e r p a c h t, \textit{op. cit.}, p. 81.
  \item \textit{Ibid.}, p. 82.
  \item \textit{Ibid.}, pp. 95–96.
  \item \textit{Ibid.}, p. 104.
\end{itemize}
adquirendi territorii.\textsuperscript{30} Within that analogy further analogies can be indicated, namely, those concerning \textit{occupatio}, \textit{usucapio} and finally – fluvial accretions.

In accordance with what has been said about reasoning \textit{per analogiam}, in order to prove that the rules of \textit{alluvio}, \textit{avulsio} and \textit{mutatio alvei} are relevant to international law, it must be demonstrated that their \textit{ratio legis} is applicable to similar situations arising between States.

States, as private subjects, have an interest in the protection of their territory, in maintaining access to a boundary river and in having a rational boundary line.

The Roman rules, which manage to strike a balance between these conflicting interests, are, therefore, the best solution that international law can provide as \textit{ius dispositivum} for relations between sovereign nations. Should two neighbours, however, perceive those rules as inapplicable to them for some reasons,\textsuperscript{31} they can always modify them in a treaty. Nevertheless, the mere fact that in a given set of circumstances the interests of two neighbouring states are better protected by rules departing from Roman law is not an argument against the existence of a certain \textit{ius dispositivum} on the subject which, being derived from general principles of law, serves to fill in the gaps in international law as created by international treaties and custom.

\section*{III. Shifts in Boundary Rivers in Private Law}

\subsection*{1. Origins of the Rules}

It is beyond doubt that we owe the legal classification and dogmatic analysis of the phenomena of the change of a boundary river to the Roman jurists.\textsuperscript{32} They were the first to distinguish between slow, gradual changes of a river, which they referred to as \textit{alluvio}, from the situation when a river breaks its banks and forms a new bed. This latter figure does not have a technical name in the sources of Roman law; the modern Romanist doctrine usually applies the Latin term “\textit{mutatio alvei}” and the authors will follow suit. However, it must be observed that some authors, especially in the United States, tend to use the term “\textit{avulsio}” for what we will call “\textit{mutatio alvei}.” This may lead to misunderstandings, since \textit{avulsio} in the Roman sources refers to the rare situation when a piece of land is torn off from one bank and carried to the opposite bank.\textsuperscript{33}

In the Roman sources,\textsuperscript{34} \textit{alluvio} was defined as an accretion of land on the bank of a river which is gradual and imperceptible. The general rule is that such an accretion, in accordance with \textit{ius gentium},\textsuperscript{35} becomes the property of the riparian to whose estate it


\textsuperscript{31} For example, two countries might want to abolish the rule of \textit{mutatio alvei} in an uninhabited area where loss of territory is not deemed important by them.

\textsuperscript{32} Cf. K. K a ń s k a, R. M a ń k o, \textit{op. cit.}, pp. 136–141.

\textsuperscript{33} \textit{Inst.} 2.1.21; \textit{Dig.} 41.1.7.2.

\textsuperscript{34} \textit{Inst.} 2.1.20; \textit{Dig.} 41.1.7.1; \textit{C.J.} 7.41.1.

\textsuperscript{35} For the Romans \textit{ius gentium} signified the law which binds all men on the basis of reason. It was considered a subsidiary source of Roman law. Cf. \textit{Inst.} 1, 2, 1; \textit{Dig.} 1, 1, 9.
accrues, i.e. the boundary between the riparians continues to follow the river. A given phenomena is gradual and imperceptible if an observer watching the river cannot state how much sand or mud has been added to a river bank at a particular moment in time. This does not preclude an observer from being able to state that changes in the course of the river are taking place if he makes his measurements at two separate moments in time, e.g. if the observer watches the river once a month or once a week and is able to tell that certain changes have occurred. This creates a problem: how long should the intervals between the measurements be for the changes to occur paulatim? In other words, are the changes still imperceptible and gradual if an observer watches the river every two minutes and can tell that it is changing its course? It is submitted that regardless of the speed of erosion and deposit, alluvio takes place as long as the river does not create a new bed which can be distinguished from the old one.

The acquisition of ownership by way of alluvio took place ipso iure and there was no need of taking possession. Alluvio and avulsio were examples of enlargement (natural growth) of a piece of land and not as an acquisition of a newly created thing.

Mutatio alvei was defined in the sources as an instance of a sudden and violent change in the course of a river. The principle of mutatio alvei operates regardless of whether the old channel has been abandoned or not. If the river continues to use both channels, an island is formed and this situation is called circumluvio. The conclusion is that a change in the course of a boundary river which is an effect not of accumulation of alluvial deposits and erosion, but of the breaking-through of a new channel does not affect the rights of ownership. In other words, the boundary does not change and follows the old channel of the river.

In classical Roman law agri limitati, i.e. lands measured by agrimensores, were excluded from the benefits of alluvio. The opposite of agri limitati were agri arcifinii (otherwise known as agri occupatorii) which had natural boundaries, such as mountains or rivers. However, the rule was probably obsolete by the time of Justinian and did not make its way into the European ius commune.

However, in cases where the river itself is not the boundary (for example, if a boundary between States is determined according to geographical landmarks other than the river) but the boundary coincides with the river, an estate should be treated

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36 H. D e r n b u r g: System des Römischen Rechts. 8th ed. by P. S o k o l o w s k i, Berlin 1911, p. 352.
37 Inst. I. 2.1.22; Dig. 41.1.7.4; Dig. 43, 12, 1, 10; C.J. 7.41.1.
39 Dig. 41.1.16. For a detailed exposition see L. M a g a n z a n i: “Gli incrementi fluviali in Fiorentino VI Inst.” (D. 41, 1, 16), 59 Studia et Documenta Historiae et Iuris 207 (1993).
40 To this effect see: A. B u r d e s e: Manuale di diritto privato romano, 3rd ed., Padova 1964, p. 415.
41 P. V o c i: Modo di acquisto della proprieta’ (Corso di diritto romano) (1952), p. 254. To the contrary effect see: P. M a d d a l e n a, op. cit., p. 119, n. 51; L. M a g a n z a n i, op. cit., pp. 211–216.
42 I.e. the boundary is defined in relation to different topographical objects. The most obvious example in the field of private law is a boundary following a wall which goes along the river. If the river is public then the
as *ager limitatus sensu moderno* and *ius alluvionis* (in the strict sense) held not to apply. As we shall see later, this was the interpretation adopted by Grotius and it continues to be a rule of international law.

At least since *ius commune* the rule of *alluvio* has been treated as an instance of accession, in accordance with the maxim *accessio cedit principali*. Accession may be defined as acquisition of property through the physical or intellectual association of one thing with another, whereby the ownership of the less important thing goes to the owner of the principal thing. Accession is treated as one of the modes of acquisition of ownership. It is classified as one of the original modes of acquisition, as opposed to derivative ones.

Through the Roman-Canon *ius commune* the concept that cases of shifts of a boundary river ought to be resolved by application of the general principle of *accessio cedit principali* entered into the common legal heritage and may be treated as a general principle of law. As will be shown below, the principle of accession as applied to fluvial accretions is accepted by all major legal systems and has been adopted by international law.

### 2. Modern Private Law

As has already been noted, municipal law is a source of international public law by way of analogy. The “general principles of law” mentioned in Article 38(3) of the Statute of the ICJ are, as has already been stated, derived from municipal law, mainly from private law. It is therefore necessary to examine the various legal systems of the world in order to see how the problem of changes in the course of a boundary river is solved in private law.

We must keep in mind that while rivers (and their beds) in public international law always form part of state territory, either *ad medium filum* or up to the *thalweg*, in municipal law the legal status of rivers varies. In some legal systems all rivers are public but in most countries at least some rivers are private. Whenever the river...
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bed is public, lawmakers are faced with a complicated situation with regard to *alveus derelictus* and *insula in flumine nata*. Most countries have followed the Roman rule but in others it has been modified or even abolished. International law cannot follow the legal systems which have modified or abolished the rule because the rules introduced by the countries concerned are based on the notion of the bed being public.

The Roman principle of *alluvio* is generally accepted both in legal systems derived from Roman law and in common law. Although all systems mention the rule as a principle, few of them state that *ius alluvionis* is limited only to *agri arcifinii*. The Roman principle of *mutatio alvei* is accepted by virtually all systems of municipal law, either tacitly or explicitly. Notably, the rule is explicitly recognised in common law.

IV. Shifts of Interstate Boundary Rivers in the United States

One of the competencies of the Supreme Court of the United States is adjudication of disputes arising between the states of the Union. Such disputes very much resemble international disputes resolved by arbitration tribunals or the ICJ.
The leading case dealing with shifts of interstate boundary rivers is *Nebraska vs. Iowa*\(^{56}\) where the Supreme Court was faced with the issue of *mutatio alvei* as opposed to *alluvio*.\(^{57}\) It has to be noted that the Court used the term “accretion” to denote *alluvio* and “avulsion” for *mutatio alvei*. The substantive part of Justice Brewer’s opinion in this case is as follows:

“It is settled law that when grants of land border on running water, and the banks are changed by that gradual process known as «accretion,» [i.e. *alluvio*] the riparian owner’s boundary line still remains the stream, although, during the years, by this accretion, the actual area of his possessions may vary. It is equally well settled that where a stream, which is a boundary, from any cause suddenly abandons its old and seeks a new bed, such change of channel works no change of boundary; and that the boundary remains as it was, in the centre of the old channel, although no water may be flowing therein. This sudden and rapid change of channel is termed, in the law, «avulsion.» [i.e. *mutatio alvei*]. These propositions, which are universally recognised as correct where the boundaries of private property touch on streams, are in like manner recognised where the boundaries between states or nations are, by prescription or treaty, found in running water. Accretion, no matter to which side it adds ground, leaves the boundary still the centre of the channel. Avulsion has no effect on boundary, but leaves it in the centre of the old channel.”\(^{58}\)

The Court in *Nebraska vs. Iowa* was fully aware of the Roman origins of the rules it applied – a large portion of Attorney General Cushing’s opinion explaining the passage of the Roman rules into common- and civil-law legal systems is quoted in the Court’s decision.\(^{59}\) What is important from the point of view of the international lawyer is the fact that the Supreme Court applied the Roman rules as rules of international law – Justice Brewer stated clearly that they are “universally recognised as correct where the boundaries of private property touch on streams, are in like manner recognised where the boundaries between states or nations are, by prescription or treaty, found in running water. Accretion, no matter to which side it adds ground, leaves the boundary still the centre of the channel. Avulsion has no effect on boundary, but leaves it in the centre of the old channel.”\(^{60}\)

\(^{56}\) 143 U.S. 359 (1892).

\(^{57}\) The first U.S. case to state the applicability of Roman rules of *alluvio* and *mutatio alvei* was *Mayor, Aldermen and Inhabitants of City of New Orleans vs. U.S.*, 35 U.S. (10 Pet.) 662, 717 (1836), where the rule was applied in a dispute between private parties.

\(^{58}\) *Nebraska vs. Iowa*, 360.

\(^{59}\) Ibid., p. 360 et seq.

\(^{60}\) Ibid., p. 360; emphasis added.
Nebraska vs. Iowa is a good example of the practical application of Corpus Iuris Civilis to a modern case. The Court had to interpret the formulation of the Institutes of Justinian to decide where the boundary between Nebraska and Iowa should be. As is known, the Roman definition of alluvio encompasses the element of imperceptibility of the changes taking place. The Court held that imperceptibility and graduality refer only to the phenomenon of the deposition of material, and not to the element of erosion.\textsuperscript{61} Nebraska vs. Iowa has been cited as a precedent in subsequent cases\textsuperscript{62} and is still the law on the subject in the United States.\textsuperscript{63} It has also been referred to in judicial decisions outside the United States.\textsuperscript{64}

V. Shifts of Boundary Rivers in International Law

1. Opinions of the Doctrine

A. Earlier Authors

The Roman principles regarding changes in the course of a boundary river were introduced to public international law by its very founder, Hugo Grotius.\textsuperscript{65} One may say that Grotius transposed the rules of Roman private law (which was binding at that time in Holland\textsuperscript{66}) to public international law without any significant modifications.\textsuperscript{67} Here, it should be noted that Grotius considered the doctrine of agri limitati to be useful for international law. According to him, a river boundary might coincide with an artificial boundary, e.g. one marked by walls or pillars. In that case any alluvio can be subject to occupation. This means that, although the boundary river gradually changes its course, the boundary itself stays where it was. This is because the river itself is not the boundary and the fact that the boundary at some point runs along the river is accidental, not substantial.

Grotius embraced the Roman doctrine of mutatio alvei giving it an original ratio. According to him, a river is not only water but, more specifically, it is water flowing over a certain bed and between certain banks (\textit{aqua alveo tali fluens ripisque talibus inclusa}). Consequently, gradual changes resulting from erosion and accretion are instances of modification of existing banks and river beds. In the case of mutatio alvei, however, according to Grotius, the river ceases to exist, as it has a new bed and new banks and therefore the boundary stays where it was.

\textsuperscript{61} Ibid., p. 369.
\textsuperscript{62} Missouri vs. Nebraska, 196 U.S. 23 (1904); Arkansas vs. Tennessee, 246 U.S. 158 (1918); Arkansas vs. Mississippi, 250 U.S. 39 (1919); Kansas vs. Missouri, 322 U.S. 213 (1944); Arkansas vs. Tennessee, 310 U.S. 563.
\textsuperscript{64} E.g., the 1992 Scots case of Stirling vs. Bartlett [1993] SLTR 763, 767-768. For reference to decisions to the contrary effect, see: K. K\'{a}esk\'{a}, R. M\'{a}ko, op. cit., p. 150, n. 108.
\textsuperscript{65} H. Grotius: \textit{De iure belli ac pacis libri tres} (curavit B.J.A. Kanters-Van Hettinga Tromp, Lugduni Batavorum 1939), 1.2 §§ 16-17 (pp. 163-164).
\textsuperscript{66} Until the introduction of a civil code in 1806, Holland was subject to Roman-Dutch Law, a mixture of Roman private law, Dutch customs and elements of Canon law. For details see, e.g. R. Zimmermann, “Roman-Dutch Jurisprudence and Its Contribution to European Private Law,” 66 \textit{Tulane L.R.} 1685 (1992).
\textsuperscript{67} Cf. the analysis in K. K\'{a}esk\'{a}, R. M\'{a}ko, op. cit., pp. 142-143.
Other important authors of the formative period, such as Pufendorf, Wolff and de Vattel generally followed the opinion of Grotius, adhering to the Roman rules regarding shifts of international boundary rivers.

**B. Modern Authors**

The modern doctrine of public international law recognises the operation of Roman private law rules regarding shifts of boundary rivers in the field of the law of nations. The doctrine accepts *alluvio* – this mode of acquiring territory is often treated under the heading of “accretion”.

The rule of *mutatio alvei* is also widely accepted, albeit with some exceptions. The most prominent opponent of recognition of *mutatio alvei* in international law was D. Anzilotti. He was followed by Accioly, who, while recognising *alluvio*, suggested that in the case of a sudden and violent change in the course of a river there were no precise principles and that the principle adopted by the majority of authorities (i.e. the Roman principle of *mutatio alvei*) did not seem reasonable. Accioly was...

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72 E.g. 1 Oppenheim’s... *op. cit.*, p. 696: “Accretion is the name for the increase of land through new formations.”
73 C. Hyde, *op. cit.*, p. 904; V. Adam: *National Frontiers in relation to International Law* (1927), p. 13; G. Hackworth: *Digest of International Law* (1940), vol. 1, p. 409: “in the absence of an agreement to the contrary, the middle of the old channel, if it previously marked the boundary, continues to do so even though the old bed may have been entirely abandoned by the stream”; 45 Am. Jur. 2d *International Law* § 29 (1999): “On the other hand, a change in territory by avulsion [i.e. *mutatio alvei* – K.K., R.M.] does not result in a change in a boundary line. Thus, if, deserting its original bed, the river forces for itself a new channel in another direction, then the nation through whose territory the river thus breaks its way suffers injury by the loss of territory greater than the benefit of retaining the natural river boundary, and that boundary remains in the middle of the deserted river bed, in the absence of any convention to the contrary”; I. Brownlie, *op. cit.*, p. 150: “Even in the absence of applicable agreements, sudden, forcible, and significant changes in river courses (avulsion) will not be considered to have changed the frontier line, which is normally the centre line of the former main channel or thalweg”; Brownlie cites the American cases of *Nebraska vs. Iowa* and *Kansas vs. Missouri*, 322 U.S. 213; P. Laski: *op. cit.*
clearly influenced by Anzilotti in that he believed that States when adopting a river as their boundary do so because it constitutes a natural obstacle (more visible than a dried river bed) and because of the benefits of navigation. Rights of navigation would be subject to the good will of the States through which the river cuts its new course. He therefore suggested an inverse solution, that is, in the case of such violent changes, the boundary should follow the new course of the river. He also proposed that a State which lost territory as a result of that change should be entitled either to reasonable indemnification or to restore the river to its old course within a stated time limit. A more recent follower of Anzilotti’s sceptical attitude to mutatio alvei is L. Bouchez, who attempts to refute the Roman rules by giving examples of treaties stating the contrary; in fact this could be used as an argument against the opinion that the rules are customary. As has already been repeated, the existence of a general principle of law applicable by the ICJ does not require any practice of nations but only the acceptance of such a principle in their municipal legislation, a point to which Bouchez pays no attention.

The vast majority of authors dealing with the subject in their treatises on international law simply state the Roman rules as rules of public international law without explaining their status. Some authors follow Lauterpacht’s view and accept the fact that the Roman rules on shifts of boundary rivers are applied in public international law per analogiam. Other authors, like Brownlie, tend to explain the presence of rules derived from Roman law concerning alluvio by logically inferring them from principles of international law. Brownlie further observes that: “[w]hatever the historical links, the Roman law cannot provide authoritative principles for law in the sphere except when the particular principle may be said to represent a general principle of law (or common sense). However, the texts on alluvio, avulsio, insula nata and alveus derelictus give insight into the types of problem which may be encountered.” Thus, Brownlie accepts that Roman rules can be assimilated by way of the “general principles of law.”

We must also keep in mind that, although the Roman rules embody common sense, this does not diminish the fact that it is Roman law (and not just common sense)

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77 Earlier authors made recourse to rules of Roman law without hesitation. Cf. S. Baker, Halleck’s International Law (1893), pp. 57–58: “Deficiencies of precedent, usage and express international authority may be supplied from the rich treasury of the Roman Civil Law.”
78 E.g. W. We n g l e r: Völkerrecht (1964), vol. 2, pp. 978–979; S. Su a r e z: Derecho Internacional Publico (1916), vol. 1, p. 206–207; P. Ł a s k i, op. cit.
79 H. L a u t e r p a c h t: Private Law..., op. cit., p. 104: “The same intrinsic similarity of relation explains also why the branch of international law which deals with acquisition of territorial sovereignty has, in addition to the requirement of effectiveness, retained both the classification and a number of other rules of the Roman law of property and possession. The rules concerning accession have been retained in toto, and their application has been extended from fluvial accession to those arising on the seashore.” Lauterpacht observes that although “many of these rules are simply the embodiment of common sense [that] does not alter the fact that they have been taken over from private law” (ibid., note 3).
80 E.g. M. S h a w, op. cit., p. 420.
81 I. B r o w n l i e, op. cit., p. 150.
82 Ibid., p. 172; emphasis added.
which is applied, naturally per analogiam. As Lauterpacht put it, “[i]t may or may not be accurate when some authors say that the adoption of rules governing fluvial accretion is not analogy to private law but simply application of common sense. But even granting the accuracy of such a statement, it does not say anything else than that it is a rule of private law which embodies here a principle of common sense.”\footnote{H. Lauterpacht, op. cit., p. 70, n. 2. The author further goes on to observe that “[m]ost rules of law embody a principle of common sense, but frequently it takes, within the society of nations, decades or centuries to strive to bestow upon an obvious principle of common sense the authority of a rule of law. It is private law which, by supplying in many cases the formulation of principles of legal reason and legal justice, smooths the way and suggests the solution” (ibid.). One might add that what Lauterpacht says here on private law is par excellence applicable to Roman private law.} One can also find writers who suggest that the principles governing shifts of boundary rivers have the status of customary rules.\footnote{E.g. R. Bierzanek, J. Symonides, op. cit., p. 205. J.H. Verzijk: International Law in Historical Perspective (1970), vol. 3, p. 565 states that “[i]t has gradually become an established treaty practice to lay down the rule that in the case of shift of the thalweg in a boundary river – unlike the case of a shift of the whole river bed, the State boundary shifts together with the thalweg.” The author observes that the rule of mutatio alvei is also “instanced by many treaties, but there are exceptions” adding that “[i]nternational practice has, however, as rule continued to maintain the old abandoned river bed as the State boundary” (ibid., p. 567). As it is known, state practice, followed by an opinio iuris are the constitutive elements of international customary law.} 

The majority of authors consider fluvial increments as an application of the general principle of accession,\footnote{H. Accioly, ibid., p. 18; A. Verdross: Völkerrecht, 5th ed. (1964), p. 287.} an original mode of acquiring territory. However, some consider fluvial increments as a consequence of the growth of the territory and not a mode of acquiring it.\footnote{S. Baker, op. cit., vol. 1, p. 172.}

Although modern doctrine acknowledges that in acquiring territory by accession there is no need of taking possession,\footnote{T.E. Holland, op. cit., p. 119.} it adds to the Roman rules a requirement typical of international law – the existence of sovereignty capable of extending to the area of the increment.\footnote{This requirement is taken from case-law – it was formulated by M. Huber in the Palmas arbitration who stated that accessorio cedit principali is applicable only “where there exists an actual sovereignty capable of extending to a spot which falls within its sphere of activity;” A. Verdross, op. cit., p. 287.}

### 2. International Case-Law

#### A. Arbitration Tribunals

(a) The \textit{El Chamisal} Case\footnote{\textit{El Chamisal} (United States vs. Mexico), 11 R.I.A.A. 316.}

In 1911, an ad hoc US-Mexican Arbitral Tribunal rendered a judgement which until now remains the most important international pronouncement on change of the course of an international boundary river. The case concerned the boundary between two countries on the Rio Grande river which, at the time, was characterised by very frequent changes of its bed, including both slow and rapid changes.
The boundary was first established by the 1848 Treaty of Guadalupe Hidalgo under which the boundary was to follow the middle of the deepest channel of the Rio Grande. According to the Arbitral Tribunal and the parties, if “this provision stood alone it would undoubtedly constitute a natural, or arcifinious boundary between the two nations and that according to well-known principles of international law this fluvial boundary would continue, notwithstanding modification of the course of the river caused by gradual accretion on the one bank or degradation on the other bank; whereas if the river deserted its original bed and forced for itself a new channel in another direction the boundary would remain in the middle of the deserted river bed.”

The Mexicans invoked the doctrine of *agri limitati*. The Treaty contained another provision which stated that the boundary should be designated “with due precision upon authoritative maps” and that landmarks should be established upon the ground to delimit the boundary. The parties also stipulated that “the boundary line shall be religiously respected by each of the two Republics, and no change shall ever be made therein, except by the express and free consent of both nations.” Mexico argued that by virtue of these additional provisions, the boundary became an artificial and inva-
riable one so that in accordance with the Roman law distinction between *agri limitati* and *agri arcifinii*, no right of *alluvio* existed. The Tribunal, however, observed that it was the custom to distribute *agri limitati* to Roman generals and legionaries, out of conquered territory as a matter of restriction of the ordinary rights appurtenant to riparian ownership. Thus, according to the Tribunal, this restriction is considered by the best authorities to have been an exceptional provision.

The Tribunal then wondered whether international practice as to boundary treaties could shed more light on this problem. It concluded that only a small number of treaties provided for a fixed boundary line notwithstanding the alterations which may take place in the river. Most of the treaties just made provisions for a boundary along the middle of the main channel of the river (or *thalweg*) without any further specifications. However, there was no case-law which could be an authority for the Tribunal (the single precedent that it cited was a French case in which the court held that if a river separates two departments, the boundary is fixed in an irrevocable manner along the middle of the bed of the river as it existed at the time of the establishment of the boundary notwithstanding any changes in the course of the river).

Mexico and the United States concluded another convention in 1884, after all the major changes in the river had already occurred. In this new treaty, the parties codified the rules of interpretation of previous treaties in such a way that they mirror the general principles of international law, i.e. the boundary was to follow the middle of the normal channel of the river notwithstanding alterations by “slow and gradual erosion and deposit of alluvium” but in the event of “any other change wrought by the force of the current, whether by the cutting of a new bed or when there is more than one channel by the deepening of another channel than that which marked the bound-

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90 Ibid., 320.
91 Ibid., 319.
92 A decision of the Cour de Cassation reported in [1858] 1 Rec. Dalloz 401.
ary [...] shall produce no change in the dividing line but the line then fixed shall continue to follow the middle of the original channel bed, even though this should become wholly dry or be obstructed by deposits." The treaty of 1884, according to the Tribunal, was entered into in order to remove the doubts arising from the interpretation of the two previous treaties.

The United States submitted an opinion by Attorney General Cushing, which was judged by the Tribunal to be "a valuable contribution to the subject by an authority on international law." Cushing presented the Roman rules as rules of international law and gave an insight into their origin and transmission into the municipal laws of various nations.

The Tribunal found that for the first couple of years there was a process of slow and gradual accretion and erosion (i.e. *alluvio*) and for the next four years erosion of the Mexican bank was very violent, although accretion still occurred slowly. The Tribunal concluded that the parties had contracted that not only accretion but also erosion must be slow and gradual. This distinguished *El Chamisal* from *Nebraska vs. Iowa* (discussed earlier in this article) where the general rules of international law were applied without exception.

The Tribunal based its judgment on the relevant law in force during the shifts of the Rio Grande in question. However, because neither of the boundary treaties in vigore at that time (those of 1848 and 1853) regulated the problem of *alluvio* and *mutatio alvei*, the commissioners made recourse to the rules of *alluvio* and *mutatio alvei*.

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93 11 R.I.A.A., 316, 323.
94 8 Opinions of Attorneys General of the United States 175. Cushing's opinion was prepared before the treaty of 1884 was concluded, i.e. in a situation in which the problem of the shift of the Rio Grande comprised a lacuna in relevant treaty law.
95 11 R.I.A.A. 316, 322.
96 "[W]hatever changes happen to either bank of the river by accretion on the one or degradation of the other, – that is by the gradual, and, as it were, insensible, accession or abstraction of mere particles – the river as it runs continues to be the boundary. One country may, in process of time, lose a little of its territory, and the other gain a little, but the territorial relations cannot be reversed by such imperceptible mutations in the course of the river. The general aspect of things remains unchanged. And the convenience of allowing the river to retain its previous functions, notwithstanding such insensible changes in its course, or in either of its banks, outweighs the inconveniences, even to the injured party, involved in a detriment, which, happening gradually, is inappreciable in the successive moments of its progression.

    But, on the other hand, if deserting its original bed, the river forces for itself a new channel in another direction, then the nation through whose territory the river thus breaks its way suffers injury by the loss of territory greater than the benefit of retaining the natural river boundary, and that boundary remains in the middle of the deserted river-bed. For, in truth, just as a stone pillar constitutes a boundary, not because it is a stone, but because of the place in which it stands, so a river is made the limit of nations not because it is running water bearing a certain geographical name, but because it is water flowing in a given channel, and within given banks, which are the real geographical boundary," 8 Op. Atys. Gen. 175, 177. Cushing cited various classical authors of international law, including Puffendorf, Wolff and Wattel.
97 "The doctrine is transmitted to us from the laws of Rome," ibid. Cushing cited Inst. 2, 1, 20-24 and Dig. 12, 1, 1, 7, as well as writers of the *ius commune* (Voet, Heineccius, Struvius) and of the common law (Bowyers). Then he presented the ways of reception: "Don Alfonso transferred it from the civil law to the Partidas [...] Thus it came to be, as it still remains, an established element of the laws of Spain and Mexico [...] The same doctrine, starting from the same point of departure, made its way through the channel of Bracton, into the laws of England, and thence to the United States," ibid.
alvei embraced by international law as well as to the subsequent behaviour of the parties, i.e. to the 1884 treaty. Effectively, the judgment was based predominantly on the 1884 treaty (despite the non-retroactivity rule).

The El Chamisal judgement was given profound consideration in a note by Anzilotti. He stated that in abstracto a norm of international ius dispositivum following the Roman rules is possible, but there would be a need to demonstrate its existence. According to Anzilotti, there is no precedent to confirm that in the absence of a treaty the states concerned would feel obliged to follow such a rule and therefore concluded that the putative rule of international law is only a doctrinal opinion.

Anzilotti criticised the judgement in El Chamisal because in his view, rather than basing its judgement solely on interpretation of the will of the parties, the tribunal acknowledged that there existed a rule of international law that governs shifts in boundary rivers – which, according to him, it should not have done. He suggested that cases concerning river boundaries should be examined solely on a case-by-case basis with account taken of all the circumstances.

Anzilotti’s demand for a demonstration of the existence of the rules of alluvio and mutatio alvei was a product of his positivist attitude to international law – he negated the existence of any other sources outside treaties and custom. This other source, previously named “law of nature,” is now encompassed by the “general principles of law” as cited in the ICJ Statute. As has already been underlined above, proof of the existence of general principles is not based on the behaviour of states but on the content of their legal systems and the adequacy of such a principle for international law.

According to Anzilotti, delimitation of a boundary is solely a product of the will of the States which is not capricious and arbitrary but, rather, reflects practical needs. He goes on to examine the presumed will of the parties establishing a frontier on a river: if there are slow changes, it can be presumed that the boundary follows the

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99 Recourse to the subsequent behaviour of the contracting parties as a means of interpreting a treaty between them is a rule of customary law, now codified in the Vienna Convention on the Law of Treaties.
100 D. Anzilotti: Intorno agli effetti..., op. cit., p. 685 et seq.
101 Ibid., p. 700.
102 Ibid.
103 “La pretesa regola di diritto internazionale dispositivo è dunque, in realtà, una semplice opinione dottrinale, nulla di più,” ibid., p. 701.
104 Ibid., p. 696.
105 Ibid., p. 703.
106 The authors wish to reiterate that they do not assume that the Roman rules received by international law are to any degree a limitation of the contracting freedom of states which can choose to follow those rules or create rules of their own. However, it is assumed that in the absence of a treaty provision or customary rule on the subject, principles derived from Roman law operate. The difference between the authors’ position and that of D. Anzilotti is that, according to the latter, in the case of a lacuna in the relevant treaty and in the absence of an applicable customary rule no international ius dispositivum could be applied. Therefore, if no will of the parties could be inferred, applying Anzilotti’s point of view an international court or tribunal would have to pronounce a non liquet. This is exactly the situation which the drafters of the Statute of the PCIJ and ICJ wanted to avoid by adding the “general principles of law” to the catalogue of the sources of law applied by the World Court.
river because the convenience of having a boundary on a river prevails. However, according to Anzilotti, in the case of sudden changes it is impossible to presume that the parties would have wanted the boundary to follow the old course of the river because it could still be the case that, even though one of the states would lose territory, access to the river would be more important than the lost territory. This, though, could only hold true if the territory was of petty significance (e.g. an uninhabited strip of sand) but hard to imagine when a city or resources-rich land was at stake.\textsuperscript{107}

Anzilotti gives an interesting example of a dispute that had arisen between Italy and the United Kingdom over the river Juba, then a boundary river between Italian Somali and British East Africa. According to a protocol of 1891, the \textit{thalweg} of the Juba was to be the boundary between the two powers. However, after the protocol had been signed, the river carved out for itself a new passage towards the sea, cutting through a strip of sand and leaving it on the Italian side of the river. Britain claimed sovereignty over both banks of the river basing its claim on the principle of international law derived from Roman law (\textit{mutatio alvei}). The Italians argued that the protocol, by establishing the boundary on the \textit{thalweg}, referred to the \textit{thalweg} in general and not as it ran at that moment.

The Italian government asked some prominent lawyers for advice: Fusinato believed there was a rule of international law governing shifts in boundary rivers; however, in his view shift of the Juba could not be regarded as a change of its bed but only a minor shift of its course in the area near the sea. Catellani argued that although the rules in question exist, they are only subsidiary and the protocol has to be given priority. According to him the word \textit{thalweg} meant the liquid mass of running water and not the river bed. Catellani also argued that the intention of the parties could be inferred from the fact that the protocol would have stated the same even if the river had then run according to its new course. In the end, the two governments settled the case by negotiations and established that the \textit{thalweg} of the Juba would always constitute the boundary so that the right bank would always appertain to Britain and the left bank to Italy.

Anzilotti commented that if we imagined the river shifting in such as to leave on its right bank the city of Kisimayu, the outcome would have been different. He concluded that everything depends on the will of the parties in a given case and the questions which arise are only issues of interpreting that will.\textsuperscript{108}

This view cannot be accepted since it would create great uncertainty and in fact blur the difference between \textit{ex aequo et bono} judgements and those based on general principles of law. A rule of international law concerning shifts of a boundary river cannot be based on the value of the piece of land between the old and new river bed, for this “value” is always subjective. Although in the case of the Juba the disputed strip of land was in fact of low value, it might have been regarded as possessing strategic value and then the attitude of the two governments would have been quite

\textsuperscript{107} D. Anzilotti, \textit{op. cit.}, pp. 702–703.

\textsuperscript{108} Ibid., p. 705.
different. The same would happen if oil or other minerals were discovered in that area.

(b) The Island of Palmas Case

A case which is frequently cited by the doctrine on the subject of alluvio is Island of Palmas. The case itself was neither concerned with fluvial increments nor with shifts of boundary rivers, but with an island. Yet, the decision contains the famous dictum by Judge M. Huber in which he formulated the additional requirement of actual sovereignty over the alluvial deposit. Huber stated that “[i]n the same way natural accretion can only be conceived of as an accretion to a portion of territory where there exists an actual sovereignty capable of extending to a spot which falls within its sphere of activity.” Although the dictum was concerned with maritime accretions, the doctrine has extended it, per analogiam, to fluvial accretions and ipso facto to the problem of shifts of boundary rivers.

B. International Court of Justice

Until now, neither the PCIJ nor its successor, the ICJ, have had the opportunity to render a judgement concerning changes of the course of an international boundary river. The only case before the ICJ which has touched on the problem was Land, Island and Maritime Frontier Dispute involving El Salvador and Honduras which was decided in 1992. After the two countries gained independence in 1821, the issue of their precise boundary line needed to be determined. A series of negotiations were carried out in order to determine what was the uti possidetis iuris as of 1821. During these negotiations, the parties came to an agreement that a part of their boundary was to follow the Goascorán river starting from its mouth on the Gulf of Fonseca. No mention was made of the precise point where the river flows into the Gulf. This did not cause any disagreement between the countries until 1970 when El Salvador claimed that the boundary was meant to follow the old course of the Goascorán which it abandoned in the 17th century, i.e. more than 200 years before the claims were brought!

This issue was brought before the Court as part of a broader dispute concerning the land and maritime frontier between the two states. El Salvador claimed that the boundary should follow the old course of the river Goascorán according to the principle of “avulsion” (i.e. mutatio alvei). Although the exact time of such a change could not be proven, it was estimated that it took place around the 17th century.

Unfortunately, the Court did not have to rule on the validity in international law of the Roman principles of mutatio alvei. The question could be determined simply by reference to the negotiations between the parties. The Court obviously ruled that the two countries, when conducting negotiations, could not possibly have had in mind

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110 Ibid., p. 839.
111 Land, Island and Maritime Frontier Dispute (El Salvador vs. Honduras, Nicaragua Intervening), 1992 ICJ 351, hereinafter referred to as El Salvador vs. Honduras.
the old bed of the Goascorán abandoned as far back as the 17th century. However, the Court did not rule out the possibility that if El Salvador had made its claims to the old river bed immediately after gaining independence in 1821, it might have succeeded. In that case, in the opinion of the Court, it would have been necessary to prove that the Roman law rules of *alluvio* and *mutatio alvei* applied under Spanish colonial law – at the time of the shift of the river it was only a border between two colonial provinces and not an international boundary.

Thus, the question whether Roman law rules of *alluvio* and *mutatio alvei* constitute general principles of international law was left open. The Court stated: “On this basis, what international law may have to say on the question of the shifting of rivers which form frontiers, becomes irrelevant: the problem is mainly one of Spanish colonial law. In fact, the alleged rule originated in Roman law as a rule applicable to private property, not as a rule relating to rivers as boundaries of jurisdiction and administration. Furthermore, whatever its status in international law – a matter to be determined, if necessary, by the Chamber, on the basis of the principle of *jura novit curia* – its possible application to the boundaries of Spanish colonial provinces would require to be proved.”\(^\text{112}\)

The Court’s *dictum* in *El Salvador vs. Honduras* leaves the question effectively open but, unlike the vast majority of the doctrine, it remained sceptical about the Roman rule of *mutatio alvei*. The rule was described as “alleged” and the Court observed that in Rome it was applied “to private property” and not to public law boundaries, i.e. “boundaries of jurisdiction and administration.”

Those opinions require comment. First of all, it is most probable that the Romans did in fact apply the rules of *alluvio* and *mutatio alvei* to boundaries between *municipia* and provinces. Secondly, it is the rules of Roman *private* law that have passed into municipal legal orders.\(^\text{113}\) Furthermore, those rules, originating from private law, are applied to interstate boundaries (which are, of course, public law boundaries) by the US Supreme Court which applies them as rules accepted by international law. Thirdly, private law analogies have always been accepted by the doctrine of international law, as was been shown in chapter four. This leads us to the conclusion that it is irrelevant for modern international law whether or not ancient Romans applied the rules of *alluvio*, *avulsio* and *mutatio alvei* to rivers which constituted boundaries between provinces. This is a question of importance for legal historians and not international lawyers.

**VII. Concluding Remarks**

Despite the fact that the International Court of Justice has not, as yet, made any definite pronouncement on the issue of the shift of an international boundary river, it


\(^{113}\) By expressing a want of applicability of the rule to boundaries between provinces in ancient Rome, the Court seems to treat Roman law as applicable directly and in its classical form, and not indirectly, *imperio rationis*, on the basis of analogy and in its form elaborated in later periods.
is assumed that the rules of *alluvio* and *mutatio alvei* are binding rules of public international law, applicable as “general principles of law” by way of analogy with municipal law. This proposition is supported by the (almost) unanimous opinion of the legal doctrine and by several judgments rendered by arbitration tribunals. Apart from that, the recognition of *alluvio* and *mutatio alvei* as general principles of law commends itself as the only reasonable rule of international *ius dispositivum*.

The arguments that can be adduced in favour of *alluvio* and *mutatio alvei* in private law and in international law are essentially the same. The fact that the *ratio legis* of the rules on *alluvio* and *mutatio alvei* in private law are similar to the reasoning behind the same rules in public international law supports the application of those rules *per analogiam*.

The first argument in support of the rules of *alluvio* and *mutatio alvei* is of an evidentiary nature. In situations of gradual and imperceptible changes of the river bed, should the boundary stay fixed regardless of the slow shift of the channel, it would be virtually impossible to trace the exact boundary line. Thus, such problems can be avoided by adopting the rule of *alluvio*. On the other hand, if a river changes its bed suddenly the old channel is easily recognisable and can continue to form the boundary, usually without causing major evidentiary problems.

Another argument is the predictability of changes of boundaries. Gradual erosion and sedimentation (*alluvio*) is easily predictable, by both riparians, be they private landowners or sovereign states, since it is an inherent feature of all unregulated watercourses. On the other hand, a sudden and violent *mutatio alvei* cannot be easily predicted and therefore it should not influence the boundary.

Thirdly, *alluvio* provides for “natural compensation.” On a given boundary river, the current causes erosion in some parts but at the same time compensates through sedimentation in other. This cannot be said of a sudden change in the course of a river when there would be no compensation for the injured owner or state.

Fourthly, should the rule of *alluvio* be abolished, the river would gradually leave its old bed. After some time this would lead to a situation in which the boundary would run at a very small distance away from the river and one of the riparians would have a thin stretch of land on the other side of the river. This piece of land would be difficult to access. Especially in international law, such a situation would be unacceptable, depriving one of the riparians of access to the river.

The fact that the rules in question originated in the private law of the Romans should not be viewed as an obstacle to their application in public international law. This is because those and many other precepts of Roman law are, as Brownlie pointed out, simply an embodiment of common sense. We refer to them as “Roman” not because they were peculiar to ancient Rome, but because Roman jurists were the first to formulate them and it was through their writings that those rules were received into modern legal systems.

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