

Research Article

Critical Analysis of the Concept of “Human Adaptations” to Discuss Its Adequacy with Socio-cultural Dynamics in Light with Ethnographic Observations and Archaeological Evidence

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Abstract

The idea of defending the thesis of the ruin of purposes comes from an observation. It is that of recurrence to adaptation to infer cultural dynamics. The idea of “human adaptations” often serves as an alibi to explain the entire activity of human organizations. Thus, the formation of social institutions, the material equipment of human groups and their transformations are generally thought of as finalized processes. The object of this contribution then lies in the finalist character of the functionalist conception of the group. The problem therefore consists of establishing proof of the latent conflictuality in the notions of function and adaptation inseparable from the group. This is to operationalize, in the demonstration of the ruin of finalities, the conflictual character congenital to each of the two concepts. All operate paradoxically thanks to the uninterrupted cohesion of the group, however questionable. Conceptual tools such as dysfunction, perverse effect, due to functionalism, will serve as a theoretical foundation for this work. They are reinforced with theoretical references acquired from the idea of the contradiction of the social as well as concepts borrowed from human ecology. These tools will help highlight contradictions between intentional ends and their necessary conditions. The existence of such resistance would therefore be sufficient to explain the ruin of the purposes to which the idea of “human adaptations” subscribes. An analysis of ethnographic observations in northern Pakistan and southern Cameroon, compared with the results of archaeological excavations in the Near East and forested Central Africa, allows us to discuss the accomplishment of the purposes assumed in the explanation. functionalist of cultural dynamics.

Keywords

Critical Analysis, “Human Adaptations”, Sociocultural Dynamics, Ethnographic Observations, Archaeological Evidence

1. Introduction

The organicist model of explaining life accounts for the organ by the purpose set by its properties. In such a conception, the properties of a structure or organization serve as variables to distinguish between organs. Thus, a specific

organization with determined properties is often attributed to an activity. Consequently, one can infer the purpose from a defined structure. While this equation succeeds in establishing equality between means and ends concerning anatomical and

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physiological organs, verifying such equilibrium remains problematic concerning human or cultural phenomena. For instance, individuals within a group can often, under various influences, pervert the legitimate ends of a socializing process through unexpected behaviors. The truth of this possibility could thus intentionally or accidentally undermine the socializing function of an organization. However, the functionalist theory, as much as others, applied to the notions of culture and function, remains resistant to ruptures unless admitting them as manifestations of anomalies [1-7]. This doctrine prevalent in interpreting material transformations manifested in residual traces of vanished societies does not predispose minds to consider contradictions and ruptures as factors of sociocultural dynamics. Functional and culturalist inferences in archaeology largely systematically explain changes recorded in archaeological remains in terms of adaptation. These inferences thus condition cultural dynamics, as a whole, by seeking to renew equilibrium with the group on one hand and physico-ecological conditions on the other. However, deviance, dysfunction, latent function, and even perverse effects experienced by sociology demonstrate the presence of ruptures opposing elements within ostensibly integrated ensembles [8, 9]. The concept of dysfunction, reinforced by those of perverse effect and latent function, contradicts the finalistic view underpinning the dyad of function and adaptation. Dysfunction, perverse effects, as well as latent function, demonstrate, contrary to manifest function, the existence of possibilities for a social organization to lead to paradoxical consequences. The reality of the paradox of consequences, a concept borrowed from André Gosselin, would thus suffice to justify a questioning of the finalist theory to which the concept of function serves as a tool [10]. This concept, complemented by that of adaptation, respectively infer in individuals and societies the search for equilibrium with the group and physico-ecological conditions. The accomplishment of such supposed equilibrium between human groups and their environment then appears as the end for which conservative theories, functionalism, and culturalism, explain individual and collective behaviors within human societies. Functionalism, in the vocation assigned to it by Durkheim, had however already renounced the search for causes of social facts to confine itself only to the explanation of their "function." Durkheim specifies that "The utility of a social fact, in other words its function in society, 'the need which it satisfies' (...), is generally unrelated to the causes which presided over its appearance" [11]. Nevertheless, this warning against the confusion of objective effects, the utility of an institution, with the causes of its existence and persistence does not seem to manifest sufficiently in archaeological interpretations. Inferences, among many archaeologists, continue to be exposed to criticism from Leach [12]. He asserts that "...The functionalist use of the notion of function was based on a logical equivocation: it in fact covers two distinct categories of reality, observable facts and supposed ends" [13]. While Durkheim seems to fear a deterministic drift of functionalism,

Leach, on the other hand, seems to see it as dogma. He suspects the congenital nature of the prophetic dimension inherent in the notion of function since its mention in functionalism.

The problem therefore lies in the operability of the conflictual nature of the notion of function to establish the proof of the failure to accomplish the ends to which human societies are programmed in the conceptual approach of the functionalist model. How can we then explain the failure observed in achieving the goals set for a social organization? This is independent of a necessary structure. And how do the reverse of such determinism and the conceptual and methodological maneuvers acting to annihilate the inherent conflictuality of the notion of function manifest in ethnographic situations? Finally, what are the implications of the work, conscious or unconscious, of annihilation of conflictuality, inseparable from the notion of function, in archaeological inferences? The thesis underlying this questioning seeks to demonstrate that the contrary action of perverse effects within a social organization can oppose resistance to the accomplishment of the ends to which a necessary structure predisposes. The demonstration of this conflictuality makes it possible to establish the ruin of the finalities set for cultural dynamics. Ethnographic observations present a reality opposed to functionalistic determinism. This doctrine regarding the group replaces the inherent conflictuality with suppositions of stability and continuity, inferred from and paradoxically to observed facts. Such an approach, based on facts and to the detriment of these, inclines archaeology to systematically reduce observable ruptures, both in ethnographic situations and in corresponding archaeological traces, into continuity. All this to legitimize a pre-established vision of dynamics within living groups as well as in the corresponding archaeological traces.

2. Material and Methods

The methodological approach of this analysis involves primary data collected in the field and secondary data gathered through a review of literature in the socio-anthropological and archaeological domains.

2.1. Material

The material collected and analyzed to verify the thesis on the ruin of purposes concerning "human adaptations" comes from various sources separated according to disciplinary domains of production. These include socio-anthropological literature, ethnographic observations, and archaeological inferences.

2.2. Method

Functionalism associated with actionalism and human ecology in a dialectical approach constitute the three major theoretical references whose conceptual tools would help

support the thesis on the ruin of purposes concerning cultural phenomena [14-17].

The approach involves analyzing the notion of function in its biological sense to highlight the explanatory principle of function in biology. This critical analysis of the application of the concept of function and adaptation to cultural phenomena through functionalism conditions the necessary approach to reveal the finalistic and conservative nature of the functionalist explanatory model.

The overlap with authors resistant to a conception of the group acquired through stability and continuity will help prove the permanence of conflict, in latency, within the group. Demonstrating such conflict will serve as evidence to confirm the instability and discontinuity within the group against the assumptions of stability and continuity inherent to functionalism.

Operationally, the group or structure is matched with a determined set of physical and biological properties generally superimposed on a human population. The demonstration of the ruin of purposes of "human adaptations" will thus consist of proving the absence of stability or continuity between a determined set of physico-biological properties and human behaviors.

The degree of diversity observable in the modalities of exploitation of common physical and biological conditions by culturally different populations on one hand, and the level of variability of the goals served by the use of the same cultural element on the other, constitute the first two necessary indicators to establish the thesis of the ruin of purposes set for "human adaptations." In archaeological deposits, the frequency of the association of the complete group of remains attributed to the Neolithic represents the third indicator to measure the ruin of purposes.

Ethnographic facts supported by observations in archaeological contexts thus serve as an experimental ground for the thesis.

3. Results

Ethnographic facts observed in Northern Pakistan and Southern Cameroon, as well as archaeological data delivered by excavations carried out in the Near East, highlight human behaviors contrary to the idea of "human adaptations."

3.1. The Coexistence of Pathans, Gujars, and Khoistanis

Frederick Barth's study in Northern Pakistan presents an ethnographic situation involving three cultures: Pathans, Gujars, and Khoistanis, sharing a common biophysical condition [18]. They develop specific "adaptation" modalities independently of environmental conditions. The Pathans represent the politically dominant group with a hierarchical and centralized social structure. Productive agriculture forms the basis of the group's subsistence. Gujars correspond to a fun-

damentally pastoral, mobile population. The subsistence system of Gujars is characterized by its variability, depending on client relationships with populations of the other two groups. Gujars exchange their labor and livestock products for grazing rights obtained from Pathans and Khoistanis. The Khoistanis, with a less centralized political system, share a similar agricultural practice with Pathans but balance it with transhumant livestock farming. This transhumance often takes Khoistanis to mountainous areas in summer while Pathans remain limited to the most fertile valleys [16]. Another example is the cohabitation of the Bakola-Bagy ði "Pygmy" populations with Bantu groups in the forest on the Cameroon coast.

3.2. Bakola-Bagy ði -Bantu Coexist in Difference

In the Congo Basin forest, facts reported by Bahuchet and observations among the Bakola-Bagy ði "Pygmies" in Southern Cameroon present another case, associating farmers with hunter-gatherers. The Bakola-Bagy ði "Pygmies" and their farmer neighbors, commonly referred to as Bantu, occupy the same forest. The former are characterized by an economy heavily reliant on hunting and gathering, with little agricultural practice. The Bakola-Bagy ði's life revolves around three types of sites: villages near drivable roads, on the forest edge, and inside the deep forest. The first two categories are occupied before the hunting season, during which Bakola-Bagy ði exchange labor for remuneration from farmers. After this period, they retreat into the forest for hunting and gathering, returning to the roads in the new season. Bakola-Bagy ði's life oscillates between the road and the forest, while Bantu remain confined to villages along the drivable roads [19, 20].

The ethnographic situations in Northern Pakistan and the Congo Basin experience similar contexts in which, despite the same physical and biological environment and the same human species, separate niches and cultures develop. The multiplicity of niches, representing cultural diversity independent of identical physico-biological conditions, signifies a dual discontinuity. This discontinuity is observed both within the common human species and across a shared living environment, even with similar physical and biological properties. Such divergence in human behavior renders the application of the adaptation concept inappropriate. If adaptation were to follow the ecological niche model, implying a determined set of species, only one culture would exist for identical physico-biological properties. The absence of this equality invalidates adaptation in the presented ethnographic situations, demonstrating that "The human species adapts less to its natural environment than it adapts this environment according to its goals" [16].

The concept of functional equivalent or substitute, introduced by Robert King Merton [4], establishes that "Just as a single element can have multiple functions, a single function

can be fulfilled by interchangeable elements" [3]. Unlike adaptation, this theorem provides a non-adaptive solution transcending adaptation's fixed goals. The ability of the same object or social institution to perform multiple tasks, as well as the diversity of human groups' lifestyles in the same physical and biological conditions, indicates diverse choices for a common species. This diversity underscores human societies' capacity to transcend the implicit goals of "human adaptations."

3.3. The Neolithic in Central Africa

The archaeological material excavated in the geographical area of Central African rainforests (Cameroon, Central African Republic, Gabon, Congo, Equatorial Guinea, Angola) since the 1960s demonstrates an absence of artifacts combining polished stone, ceramics, traces of agriculture, and livestock remains [21-24]. Technological evolution artifacts consisting of polished stone and ceramics are paradoxically often associated with wild fauna. The absence of traces of domesticated fauna and the lack of evidence of agricultural activity have not prevented attributing a fragmentary group of artifacts to the Neolithic period.

3.4. Natufian and Neolithic

Results from Jacques Cauvin's work assert the early existence of a material culture in the Natufian period, long before the Neolithic, which was later repurposed for agriculture during the Neolithic [25]. The repurposing of the same morpho-technological characteristics to serve a different purpose from its previous use is an example of functional substitute or equivalent. This functional modality has been defined in this work as one of the indicators of the ruin of finalities.

4. Discussion

The objectivity of interpreting archaeological evidence, the manifestation of functionalist orthodoxy in understanding vanished societies, and the bias of functionalism in explaining cultural phenomena are all aspects addressed in the discussion.

4.1. Archaeological Evidence Under the Reversed Gaze of Finalistic Mechanism

The conditioning of the quality of consequences by the combination of a determined set of morpho-technological characteristics belongs to a finalistic mechanism. However, the opposition of consequences, as anticipated in the configuration of a determined set of characteristics, compared to manifest effects, materializes rupture. Nevertheless, archaeological inferences continue to overlook this reality.

4.1.1. A Reversed Determinism

The observed discrepancy between anticipatory signs and the presentation of what is anticipated disappears within the concept of adaptation. The latter operates to the advantage of a preformed and necessitarian vision of cultural processes, which is modeled after the explanatory model in anatomy concerning the evolution of biological organisms [26]. This explanatory model, transposed to cultural processes, states that:

"In lower animal species, one can only understand the anticipatory signs of a superior form when the superior form itself is already known (...) lower species announce superior species of which they bear the rudiments, even if these signs of announcement are identifiable in the announcer only once the announced is present" [27].

The postulate stated, when applied to material culture, constitutes evidence that archaeology relies on a model of society of the time to rationalize each of the observed dynamics in vanished cultures. Leroi-Gourhan and Poirier compare objects to living and fossil animals [28]. The reversal of the causal order, inherent to the explanatory model of anatomical evolution, presents the risk of ignoring, if not channeling, archaeological evidence that could compromise the fulfillment of the ideal of pre-established continuity.

Such an ideal posits, for all societies, a pursuit of optimizing material advantages since the origins, without however using a necessary barometer for proof. Culturally distinct human groups sharing the same physical and biological conditions of the environment are erroneously considered adapted to the same extent as biological organisms suited for an ecological niche. The former develop separate ways of life independently of identical environmental conditions. This same latitude to surpass environmental constraints is not observed among the latter. The choice to classify both behaviors under the category of adaptation is therefore debatable.

Understanding the accumulated transformations in cultural productions cannot rely on the explanatory model of anatomical evolution without risking bias. The transposition, to objects, of the experienced relationship between living and fossil animals constitutes a bias, given the inherent capacity of cultural phenomena to surpass the limits imposed by adaptation to biological organisms. The deduction of primary states in a process starting from its pre-determined endpoint pre-disposes to a reversed determinism. This inclination leads to inferring continuities in an indifference to the objectivity of evidence of hiatuses. However, once the effects of an evolutionary process are in place, they acquire utility. But their manifest utility does not prove in any way that these effects were constituted for the purpose they manifestly fulfill [29]. The advent of the Neolithic in the Near East can thus serve as an illustration of this contradictory reality to the implicit premonition in the concept of adaptation. The premonitory use deprives the concept of its irreducible random dimension. The Near East represents one of the original centers of the

cultural phenomenon referred to as the Neolithic. The material equipment attributed to Natufian culture allows for a discussion of the anatomical model of explaining cultural processes [25].

During the Natufian period, the toolkit already encompasses all the equipment that was later repurposed for agriculture during the Neolithic with the same morpho-technological characteristics. However, the previous use of this equipment does not foretell anything in terms of continuity regarding its usefulness in agricultural production reserved for later chronological periods. Natufian populations are known to be sedentary hunter-gatherers. The polished stone tools they produce are far from the consequences of anticipation for agricultural practice.

We cannot attribute to the Natufians the foresight of future choices, nor should we be troubled by the actual presence of all the "typical agricultural" equipment that later Neolithic farmers will use: sickles, grinding and milling equipment, and even, at Mureybet Natufian, flint axes almost identical to what the hoes of the Iranian site of Hassuna and those of the Mesopotamian civilization of "Oubeid" will be two to three thousand years later. However, at Mureybet, these are carpentry tools that no one has yet thought of using for agricultural work, just as Natufian mills, according to their traces of use, have ground as much ochre as vegetation. These tools will only become agricultural through adaptation or specialization of their initial functions [25].

This excerpt, regardless of the use of the notion of adaptation, which produces a misunderstanding when applied to cultural phenomena, illustrates the absence of premonitory signs in the primary states of a cultural process. Cauvin thus refutes the reversed determinism characteristic of the explanatory model of anatomical evolution of living beings. However, it continues to serve as a reference for archaeological inferences. The arguments contained in the reported testimony oppose this model, according to which intentional ends explain the final state of a cultural process. Such a vision systematically leads to considering the previous states of dynamics in a cultural process as prophecy. Interpretations in archaeology continue, for the most part, to echo such determinism. The late conversion to agriculture of equipment already possessing all the necessary characteristics for working the land illustrates a case of functional substitute or equivalent, regardless of the chronological gap observed between the two contexts. This modality had not been considered by Robert K. Merton regarding the application of functional equivalent or substitute. The evidence that "typical agricultural" equipment had previously served, at the same sites, as carpentry tools and ochre grinding material exempts the origins of the Neolithic from the qualification of adaptation. This cultural phenomenon, observed in archaeological evidence, therefore falls under non-adaptive consequences. The emergence of the Neolithic thus testifies in favor of the thesis supporting the ruin of finalities.

4.1.2. Functionalist Orthodoxy Fills Its Gaps

The interpretation of cultural dynamics in archaeology reflects the functionalist use of the notion of function. This use involves relating two separate categories of reality: observed facts on one hand and supposed ends on the other (Bonte and Izard, 1991: 286-289). Consequently, such inferences are often underpinned by functionalist orthodoxy. However, the observation of facts allows for the disputable nature of the supposed ends by functionalism to be established. The phenomenon of archaeological gaps appears as a concept in archaeology that serves to justify the functionalist dogma. Archaeological gaps serve as arguments against the functionalist interpretation of archaeological evidence.

4.1.3. An Orthodox Neolithic

The term Neolithic originally had a simple meaning. It was defined unambiguously in reference to the technological variable only. This concept then designated the Age of the "New Stone" in contrast to the Age of the "Old Stone". The polishing of certain lithic pieces constituted the criterion conditioning its attribution. Today, the Neolithic refers to a global transformation beyond technology. The assumed mutation in the mode of acquiring food represents, at the present time, the evidence to establish the Neolithic. From hunting and gathering, there is a transition to agriculture and animal husbandry. This transition is now the central element and the determining criterion to justify the Neolithic [30].

The recurrent attributions to the Neolithic for archaeological remains lacking evidence of agricultural and/or pastoral activity reflect the manifestation of orthodoxy in accordance with the doctrine and practices of functionalism. Functionalism establishes supposed ends based on observable causes. Archaeologists systematically deduce the practice of plant and animal domestication from the presence of polished stone and ceramics. This is done regardless of the absence of objective evidence, which should confirm such a transition.

4.1.4. The Void Testifies Among Archaeological Remains

The observed gaps in archaeological deposits deserve to be considered as sources of information as much as material remains [34]. Equal interest should be given to the analysis of the present evidence as to the study of the relationship between the present evidence and the missing half to complete the group of different elements forming the Neolithic. The proven presence or absence of this last category of evidence should suffice to decide on the validation or invalidation of the expected stability in the links between stone polishing, ceramics, agriculture, animal husbandry, and sedentarism. These are the necessary and sufficient conditions for attributing the Neolithic. The functionalist conceptual model, underlying inferences in archaeology, systematically anticipates, without critical examination, the stability of the solidarity of such a group. Yet this solidarity is rarely verified in deposits

excavated in Central Africa.

The materialized gaps, at the very least, by the absence of traces of agriculture and animal husbandry in deposits bringing together polished stone and ceramics, constitute archaeological evidence. These voids among the remains testify against functionalist orthodoxy. They provide evidence of the existence of a rupture within a supposedly solidary and stable group. The absence of traces of plant and animal domestication alongside polished stone and ceramics manifests this gap. The observed facts thus establish the proof of the failure to achieve the Neolithic in the Central African forest. An end for which the functionalist conceptual model seems to program all cultural dynamics in human societies during prehistory, regardless of contexts.

4.2. Witnessing the Facts Against Functionalism

Several observable phenomena testify against the functionalist conception of cultural productions.

4.2.1. Cultural Processes Subject to Contrary Forces

The concepts of dysfunction and perverse effect make understandable the contradictions that can hinder the accomplishment of intentional ends of an organization, regardless of meeting the necessary conditions [9]. These two concepts, borrowed from functionalism, are complemented by a third: that of functional equivalent or substitute [4]. This last concept demonstrates the latitude, inherent to cultural phenomena, to transcend the limits set by adaptation to biological organisms. Although the understanding of these two distinct phenomena continues to share the same concepts, such as function and adaptation. The combination of the concept of conflict with that of historicity proves effective in establishing conflict, materialized by society's action on its social and cultural practices, as a factor of social change through the occasional consequences realized by unexpected conflict resolutions [31-33]. Conflict remains permanent between structure and intentional ends. The random nature of the transformations resulting from conflict resolutions, pitting structure against expected ends for a social organization, serves as an argument against the deterministic conception of social organizations and their transformations. The contingency of the form and direction of transformations of a social organization is explained as much as the determining action of occasional circumstances in the manifestation of the critical point of a latent conflict seems evident. Such circumstances, unplanned, thus determine the random direction of cultural processes. The orientation of this direction depends on the uncertain outcome of each occasion of the emergence of the critical point of the inherent conflict in each group. The chosen theoretical framework demonstrates that dysfunction, perverse effect, or even deviance paradoxically constitute less than simple causes of disastrous dysfunction for maintaining group solidarity, but rather, factors determining both the structuring and survival of human organizations.

4.2.2. Ends Transcend Premonitory Structure

The approach in this demonstration claims a dialectical methodological approach [17]. It confronts the inferences of archaeologists with a set of theoretical elements opposed to the idea of group stability and the dominance of structure over the individual. Individuals are considered, in the theoretical approach of this reflection, not as simple agents programmed according to the claims of a social organization. On the contrary, this contribution gives the individual the status of an actor [35, 36]. The individual benefits from the possibility of unpredictable behaviors at the expense of norms, values, or structuring physical and biological properties. Phenomena related to structure are classified into three categories. The first concerns all forms of arrangements instituted by a society for its harmonious functioning. The second refers to each of the distinct groups of physical and biological properties overlaid on a human population. The third corresponds to each of the groups of determined morphotechnological characteristics conditioned by a defined socio-economic organization model. The norm of a social group, a determined set of environmental properties, and determined morphotechnological characteristics of material culture represent here the three forms of structure from which this work tries to establish the latent opposition between end and structure.

4.2.3. Challenging a Concept

The concept of ecological niche, shared between natural and social sciences, unified to form human ecology, helps to critique the concept of adaptation. The latter appears inadequate in understanding the complexity and latitude manifested in cultural dynamics. The use of adaptation to explain the diversity of human behaviors within a chronological unit and under common physical and biological conditions contradicts the arbitrary essence of culture. Cultural practices can often appear materially irrational, contrary to what the concept of ecological niche suggests in its biological or original sense. This concept, in its literal sense, better translates adaptation through the notions of "limiting factor" or "ecological constraint." Both indicate that "the existence and development of an organism are limited by the presence of certain resources" [16]. If, in its biological sense, the ecological niche implies a close dependence of biological organisms on their environment, the same concept supports the opposite in human ecology. Transposed to cultures, the ecological niche shows cultural entities, belonging to the same species, *Homo sapiens sapiens*, living differently in a physically and biologically common environment. This observation thus establishes the proof of culture's indeterminacy to its environment. The concept of ecological niche then helps demonstrate the inappropriate nature of the concept of adaptation to qualify non-adaptive effects whose causes are to be found in the random and materially irrational nature of culture [37-39].

4.3. Cultural Dynamics Under the Dictate of Orthodoxy

According to terminology borrowed from functionalism, the functioning and dynamics recorded in human societies are explained as consequences of a constant search for balance. This approach suggests societies as sets for which maintaining cohesion is the goal. Such a conception reveals the conservative tendency underlying the theory in question. It represents human groups as pacified entities continually stable. Thus, the interpretation of successively accumulated transformations within human societies is also influenced by the same conservative orthodoxy. Thus, changes observed across different social fields are systematically inferred in terms of adaptation to justify continuity and implicitly dismiss the hypothesis of rupture or conflict.

4.3.1. Sacrificing Reality for Theory

The notion of adaptation can be seen as an excuse in the face of the reality of ruptures. The experimentation of these ruptures contradicts a conceptual model claiming the integration and stability of the group, regardless of inherent dynamics. Because contradictions remain inherently latent within each human group, the use of the adaptation concept illustrates bias. It works to legitimize a conservative dogma through negative sanction and marginalization of contradiction. This explains the negative and marginal connotations systematically associated with phenomena incompatible with claims of cohesion and stability inherent in a preconceived conceptual model focused on conservation and therefore closed to contradiction.

The terms "anomaly" and "social pathology" are generally used to explain deviations from the observed norm in society [9]. The choice of these two words to describe original phenomena compared to a totalitarian norm, from the functionalist point of view, confirms the undesirable nature of exceptionality. Instead of categorizing individuals who manifest deviations from the norm as anomalies, the integrity of the functionalist conceptual model should be questioned. The functionalist obsession with contradiction, paradoxically inherent to the group, and the blindness of this conceptual model to the complementarity between balance and opposition suggest a fresh perspective on the location of the site affected by handicap or pathology. The functionalist model seems to trade the infirmity inherent in its acuity for the concrete integrity of facts, materialized through individual or particular phenomena, objectively original but unfairly labeled as pathology. Thus, there is ultimately an inversion of the position of the anomaly's localization pole. Phenomena originally devoid of this quality end up being negatively charged and marginalized to become anomalies.

The status of anomaly unfairly attributed to contradictory sociocultural phenomena, compared to a rigid conceptual model, proves to be a bias against reality. Conflict, far from being a source of disaster, remains a determining factor in

dynamics. According to Georg Simmel, "society needs association as much as competition." He even recognizes a "true social function" to conflict [32, 40]. Lewis Coser in a similar logic, establishes the functional nature of social conflict [41]. He describes it not as a threat to perpetuation but as a cohesion operator of the group. Conflict serves as a "safety valve" and, consequently, prevents group disintegration.

Following Simmel and Coser, Dahrendorf supports the thesis of the omnipresence of conflict in society. The oppositions generated by conflict do not completely ruin the group. However, the consequences of resolving oppositions inevitably lead to unpredictable changes in society due to novel compromises [31]. Contrary to the functionalist model, according to which conflict is a cause of dysfunction contrary to the group's destiny, namely the achievement of social cohesion, Dahrendorf rather conditions the dynamics necessary for the survival of societies on what functionalism considers an anomaly. In Dahrendorf's view, unexpected transformations, cumulatively recorded in the randomness of unexpectedly manifested conflicts, can no longer be conditioned by a determined organization. Instead, changes in an organization lead to new but unfinished outcomes. That is, devoid of intentional purpose, simply because they lead to situations that are at least indeterminate if not paradoxical [10]. Ends that were not necessarily predisposed by the characteristics of a pre-established organization. This reality then establishes the possible manifestation of a gap between, on the one hand, the structure and an expected end on the other hand. This is the principle of inherent continuity in the notion of function that is thus attacked through the existence of the demonstrated gap between the end and the structure, regardless of the meeting of the necessary properties present in a structure.

4.3.2. Dysfunction Serves a Function

The functionalist model, often supplemented by culturalism, conceives the integration of the individual into the group as an unchallengeable end [1, 42, 5, 43, 6]. Such a vision regards the individual as a mere agent, devoid of any freedom of choice, and destined to slavishly mimic behaviors to the norm. Arguments put forth by Goffman (1973) prove otherwise to such a claim. They contribute to reinforcing doubts regarding the underlying continuity to the notion of function. Goffman warns against the naivety of believing that because norms are countless and omnipresent, individuals live in a moral universe. But, as the author specifies, since they are actors, not agents, individuals are more concerned with creating the impression of adhering to the norm than actually doing so. To be socially accepted, individuals necessarily need to possess a great deal of experience in staging techniques concludes Goffman [44]. This conclusion provides additional evidence of the latent rupture between structure and its purpose.

In the same actionalist spirit, Touraine challenges the idea of a pacified society devoid of contradictions [15]. He refutes the dual functionalist and culturalist reductionism. This reductionism consists of reducing society to its rules and mode

of functioning. However, he opposes, a society always acts on its social and cultural practices to modify or surpass them. It is this capacity of societies to self-destruct for their perpetuation that the author designates as historicity.

The quartet Simmel-Dahrendorf-Coser-Touraine thus suggests re-evaluating the status of contradictions within the group. Far from being a manifestation of disastrous dysfunction for group continuity, conflicts are requalified to establish function instead. Conflicts, in addition to being omnipresent in every group, condition society's survival. However, taking this reality into account continues to be lacking in interpreting residual witnesses of disappeared societies. These interpretations remain largely influenced by the functionalist dogma closed to conflict.

4.4. Functionalism Governs in Archaeology

Deciphering archaeological remains through the lens of functionalism repudiates rupture and imposes seeing changes in terms of continuity at the expense of the objectivity of facts. The use of the recurring adaptation concept in archaeologists' discourse, as well as the argument of soil acidity, allegedly responsible for archaeological gaps, constitute the two facts to prove the influence of functionalism in constructing the meaning of residual witnesses of disappeared societies.

4.4.1. Adaptation Seeks the Point of Optimal Balance

The word "cohesion" applies to a group whose different parts adhere to each other. Cohesion then implies, by definition, the negation of the existence of rupture or asymmetry of the elements of the same set, compared to each other. In the conceptual approach specific to prehistoric archaeology, for example, a determined group of physical and biological conditions is systematically superimposed onto a human population. Thus, both the form and transformations of cultural productions, whether material or immaterial, are systematically considered as conditioned by the search for the realization of balance with the determined properties of a physico-biological environment. The concept of a cultural area participates in such functional determinism [45]. The latter, under the pretext of the necessity of adaptation to the environment, establishes symmetry between the physical properties of an environment and cultural phenomena. And it does not allow thinking about this relationship in terms of asymmetry. However, there is not yet a barometric scale to verify the level of adequacy between the morphotechnological characteristics of material equipment, the transformations they accumulate, and the physical and biological properties of an environment. Thus, the notion of adaptation, used to explain the formation and transformations recorded in material culture, proves to be an excuse and, therefore, subject to caution. Once transposed to sociocultural phenomena, the reference to the concept of adaptation apart from its accidental dimension can constitute a source of bias. The random nature

is then evacuated in the application of the adaptation concept to human productions. Yet, just as selective activity exercised by nature determines the form of biological organisms and their transformations, cultural arbitrariness deserves to be considered as a determining factor in explaining cultural dynamics.

The practice of the adaptation concept, devoid of its random selective dimension, consists of closely regulating cultural processes to an explicit or implicit intention. This perfectionist conception of cultural dynamics turns minds to think that people always meticulously examine all their productions and shape them for optimal usefulness. Subordinating the presentation of a state to an intention of optimizing material efficiency in a cultural process is to transform consequences into causes. The march towards the formation of a state is then explained by its outcome. This is to rationalize transformations to a pre-established conception of history. The inversion of the causal order, assimilable to "adaptationism," encompasses the whole meaning of the theory of final causes [46]. On this subject, Stephen Jay Gould adds: "Evolutionary biologists have all too often succumbed to a tempting mode of argumentation about adaptation. We too often estimate that each structure is designed for a specific purpose, and we thus build (in imagination) a perfect world, not so different from that concocted in the 13th century by theologians of nature, who 'proved' the existence of God by the perfect architecture of organisms" [29].

Attributing the status of cause to effects, through adaptation, constitutes an operative approach to balance the relationships between the different parts forming a whole. This is in accordance with the vision of a conceptual model acquired for the preservation of balance and continuity, to the detriment of concrete facts. However, observation shows an omnipresence of conflict and rupture in the relationships that functionalism imposes to see in terms of harmony. The interpretation of archaeological remains adopts such a vision with all the induced finalistic charge.

The effects of cultural processes represented in the residual material witnesses of disappeared societies are systematically interpreted as the result of adaptation to the environment. These remains are generally presented as the product of the search for the realization of optimal balance with the physical and biological properties characteristic of an environment. However, in the absence of a means to objectively measure the alleged scale of adequacy between cultural productions and environmental conditions, the validity of the equation remains questionable. No evidence establishes the optimal nature of the material productions found, by chance in selective preservation in the residual witnesses of disappeared societies, compared to the physical and biological properties characteristic of an environment. In the wide range of possibilities offered by the environment, societies can often make choices contradictory to the optimist vision of balance inherent in the functionalist model. But exceptions to this model, which materialize the rupture with such a vision, are often

biased by the concept of adaptation. The latter optimizes balance and continuity while the concrete facts often manifest their absence, contradicting the assumptions of the functionalist dogma.

4.4.2. Inferences in Archaeology Optimize Equilibriums

Alain Galloway characterizes the notion of adaptation, recurrent in the discourse of theoretical approaches in archaeology, as tautological. This is precisely because the author shares, with this discourse that he nevertheless criticizes, the evidence of adaptation for every active human group.

"In conclusion, we cannot fail to mention the tautological nature of the notion of adaptation, which often appears in the phraseology of anthropological archaeology. The introduction of this concept into the arsenal of archaeological explanation is indeed of no use. A human group that survives and develops is always adapted to its environment" [47].

Despite his critical attitude, the idea of seeking balance, underlying the interpretation of archaeological remains, remains vivid in Galloway's mind. According to him, human groups are unconditionally adapted to their environment. However, this opinion raises doubts [26, 29]. Instead of focusing on balance by seeking to demonstrate the adaptation of human societies to their environment, Galloway finds that "noting this adds nothing to the understanding of things. Temporary or partial imbalances are more interesting" [47].

Contextual archaeology, another theoretical approach underlying inferential practices among archaeologists, demonstrates an equal predilection for seeking balance. Like processual archaeology, it adheres to the unconditional adaptation of human societies and its necessity. However, both approaches assign control of the adaptive function separately, to the ecological environment for processual archaeology, and to ideas and symbols for contextual archaeology [47]. Regardless of the schools of thought, archaeology conceives the survival of human societies as a consequence of adaptation. If adaptation assumes a state of balance considered as the purpose of human society's activity, then the interpretation model of archaeologists, conditioning the survival of human groups to adaptation, proves to be teleological. This model explains not the effects, namely adaptation or balance, by the causes, the presentation of the association of archaeological evidence, but rather determines the causes by their consequences. This is by explaining archaeological evidence by adaptation.

The implicit thesis of a growing and continuous search for balance with the group (society) and the physico-biological environment, to explain, due to adaptation, the morphotechnological characteristics of the residual material witnesses of disappeared societies, demonstrates an inversion of the causal order. Thus, the claims to adaptation, established as a purpose, are often used to explain the association of a set of morphotechnological characteristics with faunal and floral macro-remains. Whereas objectively, it is this association that should be relied upon to induce the presumed adaptation. This

approach carries the risk of obscuring the contradictory evidence to the orthodoxy of the functionalist model. Contradiction materializes in forms of association that often bring together, in archaeological deposits, phenomena presumed incompatible and therefore opposed to the functionalist vision. Therefore, the configuration of the association of archaeological evidence deserves to be established as the determining variable in explaining the dynamics concerning cultural processes, much less than the argument of adaptation. The practice of such an alternative approach would suffice to prove the occasional nature of the new directions imposed by dynamics for which the unexpected resolutions of conflicts between elements of the same organization constitute the source.

Current epistemological practices in the humanities condition the formation and functioning of an organization to a hypothetical intention of optimizing balance. The interpretation of archaeological remains based on the model criticized here systematically dismisses the idea of spontaneous formation and functioning of an organization, following continuous and unexpected interruptions. However, these interruptions determine the dynamics of cultural processes. These processes paradoxically owe their continuity to the contradictions between elements within the same organization. The unpredictable outcome of these processes, in continuous interruption, therefore contradicts the teleological idea of accomplishment or anticipation of ends. Thus, instead of always seeking to force conformity between the presentation of archaeological phenomena and the functionalist doctrine, through explaining morphotechnological characteristics and their transformations by seeking the realization of a debatable finality, curiosity should rather be shifted. Interest should be given to both the experiences of living societies and the archaeological evidence presented, in terms of contradiction with the established teleological vision. However, the reading of the dynamics of cultural processes of disappeared societies remains largely under the light of an organicist model inducing a finalizing mechanism.

The teleological mechanism attributed to the interpretive approach of archaeological phenomena can be justified by this tendency to systematically establish adaptation as the sought-after goal for a determined set of morphotechnological characteristics assembled in residual evidence. In the absence of a scale of magnitudes allowing for an objective measurement of the level of adequacy of morphotechnological characteristics with the potential of a determined physico-biological environment, it remains difficult to prove the balance of the equation anticipated in the concept of adaptation, without critical examination.

5. Conclusion

The issue at the heart of this contribution was the operability of the conflictual nature inherent in the notion of function to establish the failure to achieve the ends set by the concept of adaptations to human organizations. Thus, the aim

was to highlight the intrinsic conflictuality of the notion of function, for which adaptation serves as a means. The invocation of the concepts of perverse effects, supported by that of dysfunction, made it possible to dismantle the inherent conflict within the group, independently of any supposed cohesion. The analyses observed that contradictory social phenomena, in a conception of the group acquired through the thesis of balance and harmony, are often relegated to marginality and pathology. Furthermore, it appears that the consequences of conflict, pitting marginal cultural phenomena against the norm, paradoxically constitute the cause of the dynamics necessary for the group's survival. This is because breaking with the established order necessarily occasions conflict, which opposes opposing forces and an order. The random consequences of such a confrontation have thus been identified as the explanatory cause of the group's continuity. The concept of historicity, translating the latitude of the group to act through confrontation on itself for its change, has demonstrated a relative independence of cultural dynamics from stable external factors. With the instability of the causes thus demonstrated, does the model of inferring cultural dynamics acquired through continuity find itself in inadequacy with reality?

Ethnographic observations have shown the random nature of cultural choices under common physico-biological conditions. This reality has revealed the inadequacy of the concept of adaptation compared to culture, a materially irrational phenomenon. The rationality of cultural facts lies in the arbitrariness contrary to the rigid law of adaptation. All this has revealed adaptation as an alibi in inferences concerning the study of human phenomena. The pretext of adaptation operates in favor of a functionalist conception of cultural dynamics. Upon analysis, the explanatory model of cultural phenomena inspired by functionalism proves resistant to rupture or hiatus. However, ethnographic observations in Southern Cameroon and Northern Pakistan present hiatuses in the exploitation of the same physical and biological environment. Furthermore, a critique of the study of archaeological evidence provided by excavations in the Central African rainforest has shown a reality often in contradiction with the rationalist conceptual model specific to functionalism. However, it is nevertheless noticed that archaeologists' inferences insist on assuming the presence of the Neolithic in the Central African rainforest, in the absence of necessary complementary evidence to complete the group of material facts referenced there. It appears that in situ remains present gaps. The presence of these gaps in the deposits, coupled with the diversity of practices observed in an ethnographic context for societies sharing the same physical and biological conditions, contradicts the functionalist conception of cultural dynamics. All these facts contribute to demonstrating the questionable nature of anticipating the direction of cultural dynamics. These dynamics can often manifest a paradox compared to previous states in a process. The notion of the paradox of consequences constitutes an additional argument

to support the thesis of the failure of purposes concerning cultural phenomena. This could serve as an implicit argument to undermine the presence of the Neolithic in the Central African rainforest. Regardless of the presence of a necessary technological structure, polished stone, and ceramics, the purposes set for such a group, namely agriculture and animal husbandry, seem to be undermined through the testimony of the hiatus present in the archaeological deposits formed in the Central African rainforest.

Conflicts of Interest

The author declares no conflicts of interest.

References

- [1] Parsons, T. 1949. *The Structure of Social Action* (1937). 2nd edition. New York: The Free Press; 1949, pp. 44-46.
- [2] Durkheim, É. *Les règles de la méthode sociologique* (1895) [The Rules of Sociological Method (1895)]. Paris: PUF; 1977, pp. 65-72.
- [3] Rocher, G. *Introduction à la sociologie générale 2. L'organisation sociale* [Introduction to General Sociology 2. Social Organization.]. Paris: Éditions HMH Ltée; 1968, pp. 145-177.
- [4] Merton, R. K. *Éléments de théorie et de méthode sociologique* [Elements of Sociological Theory and Method]. Paris: Plon; 1965, pp. 140-145.
- [5] Radcliff-Brown, A. «Le concept de fonction dans les sciences sociales», *Structure et fonction dans la société primitive* ["The Concept of Function in the Social Sciences," *Structure and Function in Primitive Society*]. Paris: Éditions le Minuit; 1968, pp. 281.
- [6] Malinowski, B. *Une théorie scientifique de la culture* (1944) [A Scientific Theory of Culture (1944)]. Paris: Éditions du Seuil; 1970, pp. 86-134.
- [7] Mauss, M. *Sociologie et anthropologie: précédé d'une introduction à l'œuvre de Marcel Mauss* [Sociology and Anthropology: Preceded by an Introduction to the Work of Marcel Mauss]. Paris: PUF; 1981, pp. 145-227.
- [8] Becker, H. S. *Outsiders* (1963). Paris: Maitailé 1985, pp. 43-45.
- [9] Boudon, R. *Effets pervers et ordre social* [Perverse Effects and Social Order]. Paris: PUF; 1989, pp. 251-252.
- [10] Gosselin, A. *La rhétorique des conséquences non prévues, les idéologies et l'électeur rationnel* [The Rhetoric of Unintended Consequences, Ideologies, and the Rational Voter]. *Hermès, LA Revue*. 1995, N° 17-18, pp. 299-319. 10.4267/2042/15226.
- [11] Mesure, S., Savidan, P. *Dictionnaire des sciences humaines*. [Dictionary of Human Sciences]. Paris: PUF; 2006, pp. 466-469.

- [12] Leach, E. Les systèmes politiques des hautes terres de Birmanie: analyse des structures sociales kachin [Political Systems of the Highlands of Burma: Analysis of Kachin Social Structures]. Paris: Maspero; 1972 pp.
- [13] Bonte, P., Izard, M. Dictionnaire de l'ethnologie et de l'anthropologie [Dictionary of Ethnology and Anthropology]. Paris: PUF; 1991, pp. 286-289.
- [14] Oberschall, A. Social Conflict and Social Movements. New Jersey: Prentice-Hall Englewood CliffsNJ; 1973, pp.
- [15] Touraine, A. La voix et le regard [The Voice and the Gaze]. Paris: Éditions du Seuil; 1978, pp. 108-110.
- [16] Garine, E., Erikson, P. Écologie et sociétés. In Ethnologie Concepts et aires culturelles [Ecology and Societies. In Ethnology Concepts and Cultural Areas]. Paris: Armand Colin; 2001 pp. 116-139.
- [17] Gurvitch, G. Dialectique et sociologie [Dialectic and Sociology.]. Paris: Flammarion; 1962, pp. 17-47.
- [18] Barth, F. Ecological Relationships of Ethnic Group in Swat, Northern Pakistan. American Anthropological Association. 1956, 58. pp. 1079-1089.
- [19] Bahuchet, S. Les Pygmées Aka et la forêt centrafricaine [The Aka Pygmies and the Central African Forest]. Paris: SÉLAF; 1985, pp.39-401.
- [20] Medjo, P. P. P. Approche archéologique et ethnographique des dynamiques socio-culturelles chez les Bakola-Bagydi (Sud-Cameroun). Thèse Ph. D Université de Yaoundé I [Archaeological and Ethnographic Approach to Socio-Cultural Dynamics among the Bakola-Bagydi (South Cameroon). PhD Thesis, University of Yaoundé I], 2019.
- [21] (de) Maret, P. Sédentarisation agriculture et métallurgie du Sud Cameroun. Synthèse des recherches depuis 1978. In L'archéologie au Cameroun [Sedentarization, Agriculture, and Metallurgy in Southern Cameroon. Synthesis of Research since 1978. In Archaeology in Cameroon]. Paris: Karthala; 1992, pp. 247-260.
- [22] Clist, B. Centrafrique. In Aux origines de l'Afrique Centrale. [Central Africa. In The Origins of Central Africa]. Paris: Sapia; 1991, pp. 155-160.
- [23] Holl, A. Cameroun. In Aux origines de l'Afrique centrale. [Cameroon. In The Origins of Central Africa]. Paris: Sapia; 1991, pp. 149-154.
- [24] Huysecom, E. Le concept de néolithique en Afrique Noire vu au travers d'observations ethnoarchéologiques [The Concept of Neolithic in Black Africa through Ethnoarchaeological Observations]. International Union of Prehistoric and Protohistoric Sciences. 1996, 15, pp. 257-262.
- [25] Cauvin, J. Naissance des divinités naissance de l'agriculture. [The Birth of Gods, the Birth of Agriculture]. Paris: CNRS; 2010, pp. 18-40.
- [26] Medjo, P. P. P, 2021. L'explication de la culture à partir des "Pygmées" Bakola-Bagydi du Sud-Cameroun: entre recherche de l'efficacité matérielle et libération de l'humain [Explaining Culture from the Bakola-Bagydi "Pygmies" of Southern Cameroon: Between Material Efficiency and Human Liberation]. Revista de @ntropologia da UFSCAR. 2021, Volume 13, Numero 2, pp. 80-99.
- [27] Naccache, B. Marx, Engels et le singe [Marx, Engels, and the Monkey]. Paris: L'Harmattan; 2000, pp. 11-16.
- [28] Leroi-Gourhan, A., Poirier, J. Ethnologie de l'Union française. Tome1 [Ethnology of the French Union. Volume 1]. Paris: PUF; 1953 pp. 43-44.
- [29] Jay Gould, S. Quand les poules auront les dents [When Chickenheads Have Teeth.]. Paris: Fayard; 1984, pp. 171-182.
- [30] Leroi-Gourhan, A. Dictionnaire de la Préhistoire [Dictionary of Prehistory]. Paris: PUF; 1998, pp. 773-779.
- [31] Dahrendorf, R. Classes et conflits de classe dans la société industrielle (1957) [Classes and Class Conflicts in Industrial Society (1957)]. Paris: Mouton; 1972, pp. 279-280.
- [32] Simmel, G. Le Conflit. [Conflict]. Paris: Circé 1992, pp. 122-125.
- [33] Touraine, A. La production de la société (1973) [The Production of Society (1973)]. Paris: Éditions du Seuil; 1993, pp. 322-327.
- [34] Medjo, P. P. P., 2020, «La question des lacunes archéologiques dans l'interprétation des vestiges des changements techniques: perspectives de recherche inspirées des observations ethnographiques chez les «Pygmées» Bakola-Bagydi du Sud-Cameroun. In Archéologie du Cameroun. Des strates du sol aux pages d'histoire [The Question of Archaeological Gaps in Interpreting Technological Changes: Research Perspectives Inspired by Ethnographic Observations among the Bakola-Bagydi "Pygmies" of Southern Cameroon. In Archaeology of Cameroon. From Soil Layers to History Pages]. Yaoundé Éditions de Midi; 2020, pp. 267-286.
- [35] Goffman, E. Asiles (1961) [Asylums (1961).] Paris: Éditions de Minuit; 1968, pp. 245-268.
- [36] Garfinkel, H. Studies in ethnomethodology, New Jersey: Printice-Hall, Inc Englewood Cliffs; 1967, pp. 1-104.
- [37] Afriques, "Recasting forest and food-producer population interaction as a pivotal prehistoric process of change". Available from: <https://doi.org/10.4000/afriques.4061/>. [Accessed 23 février 2024].
- [38] Afriques, "Distribution des pratiques mégalithiques actuelles et subactuelles et dynamique du peuplement dans le Faro au nord du Cameroun Durant ces deux derniers siècles" ["Distribution of Current and Subcurrent Megalithic Practices and Dynamics of Settlement in Faro in Northern Cameroon During the Last Two Centuries"]. Available from: <https://doi.org/10.4000/afriques.4625/>. [Accessed 23 février 2024].
- [39] Afriques, "Approches comparative et analytique des pratiques funéraires anciennes à Mbanza Kongo (Province de Zaire, Angola)" ["Comparative and Analytical Approaches to Ancient Funeral Practices in Mbanza Kongo (Province of Zaire, Angola)."]. Available from: <https://doi.org/10.4000/afriques.4131/>. [Accessed 23 février 2024].

-
- [40] Lallement, M. Histoire des idées sociologiques de Parsons aux contemporains. 3^e édition [History of Sociological Ideas from Parsons to Contemporary Thinkers. 3rd edition]. Paris: Armand Colin; 2007, pp. 13-217.
- [41] Coser, L. Les Fonctions du conflit social (1956 et 1967) [The Functions of Social Conflict (1956 and 1967)]. Paris: PUF; 1982, pp. 83-88.
- [42] Mead, M. Mœurs et sexualité en Océanie (1928-1935) [Customs and Sexuality in Oceania (1928-1935)]. Paris: Plon; 1963, pp. 251-252.
- [43] Kardiner, A. L'Individu dans sa société (1939) [The Individual in His Society (1939)]. Paris: Gallimard; 1969, pp
- [44] Goffman, E. La Mise en scène de la vie quotidienne (1966, 1971) Tome 2 [The Presentation of Self in Everyday Life (1966, 1971) Volume 2]. Paris: Éditions de Minuit; 1973, pp. 25-41.
- [45] Kroeber, A. Cultural and Naturel areas of North America. Berkeley: University of Berkeley Press; 1939, pp.4-5.
- [46] Burbage, F. La nature [Nature.]. Paris: Flammarion; 1998, pp. 230-232.
- [47] Gallay, A. L'archéologie demain [Archaeology Tomorrow]. Paris: Belfond; 1986, pp. 46-98.